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# PUBLIC HEALTH

and THE NATION'S HEALTH

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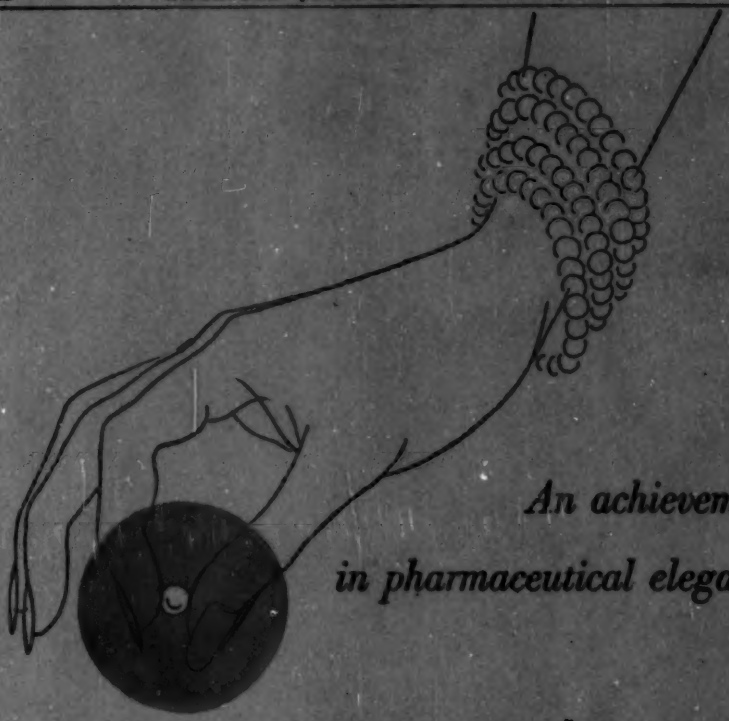

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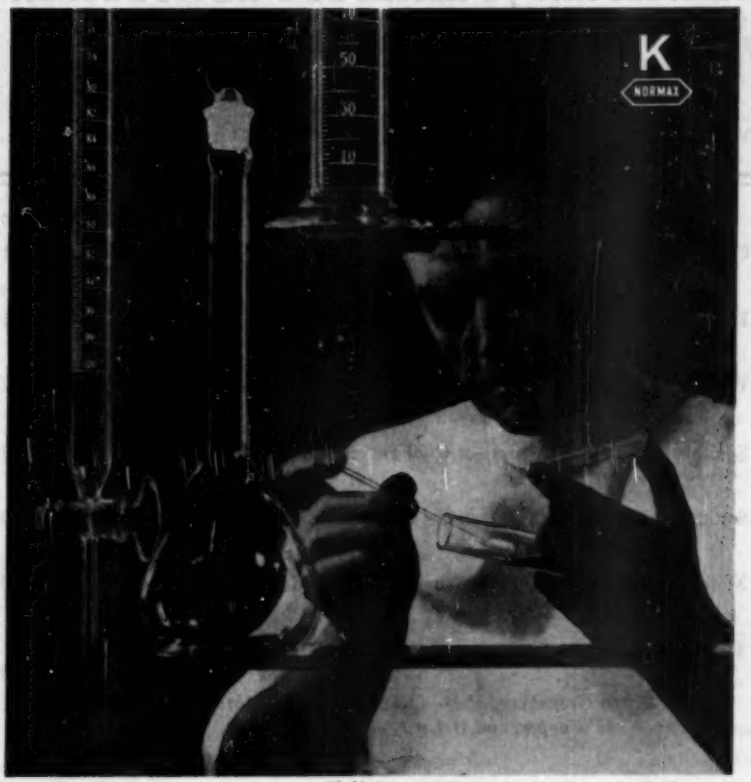


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Official Monthly Publication of the American Public Health Association, Inc.

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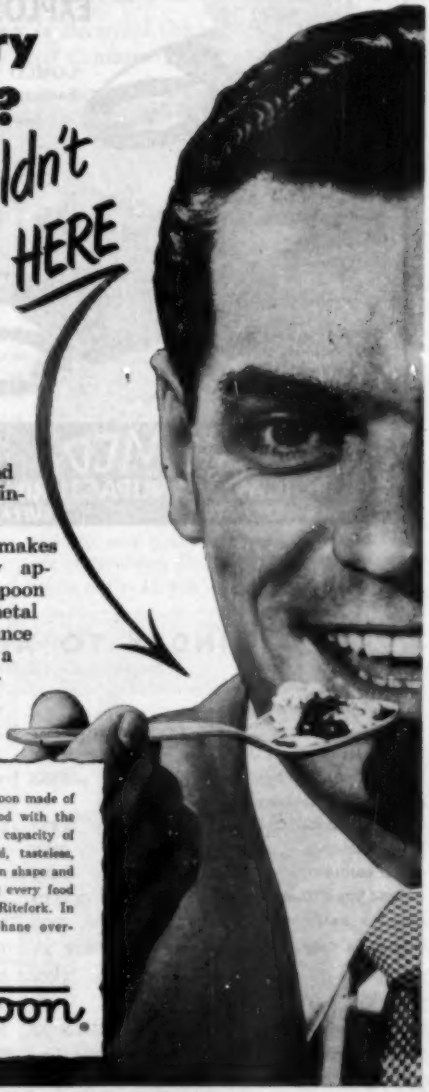

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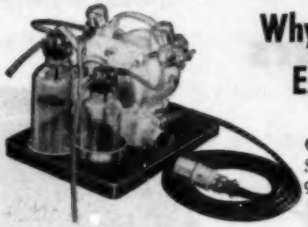

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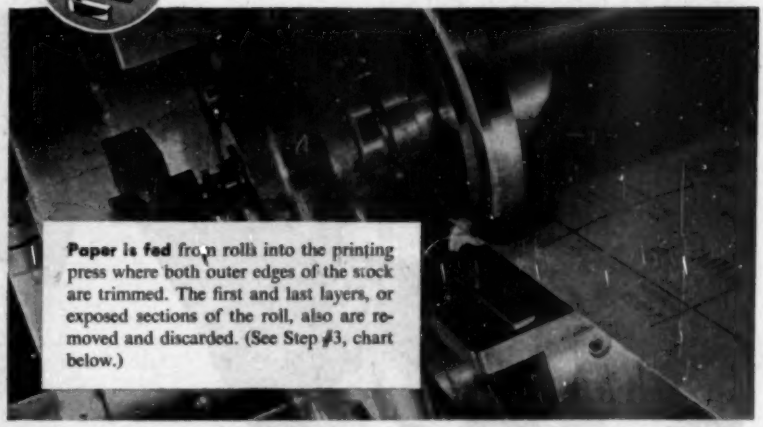

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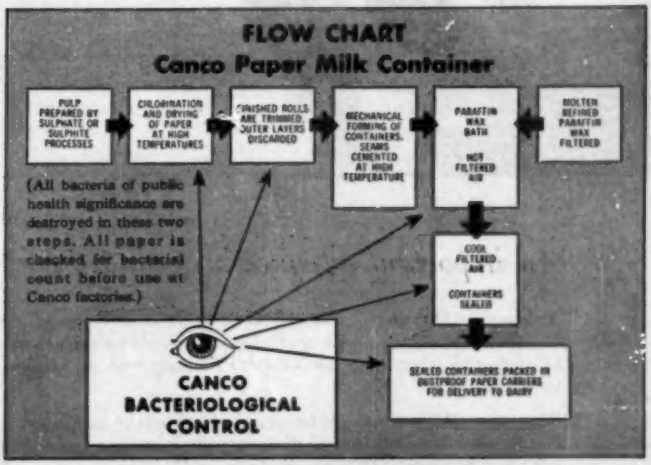
(1) *The Milk Dealer, 4-39.*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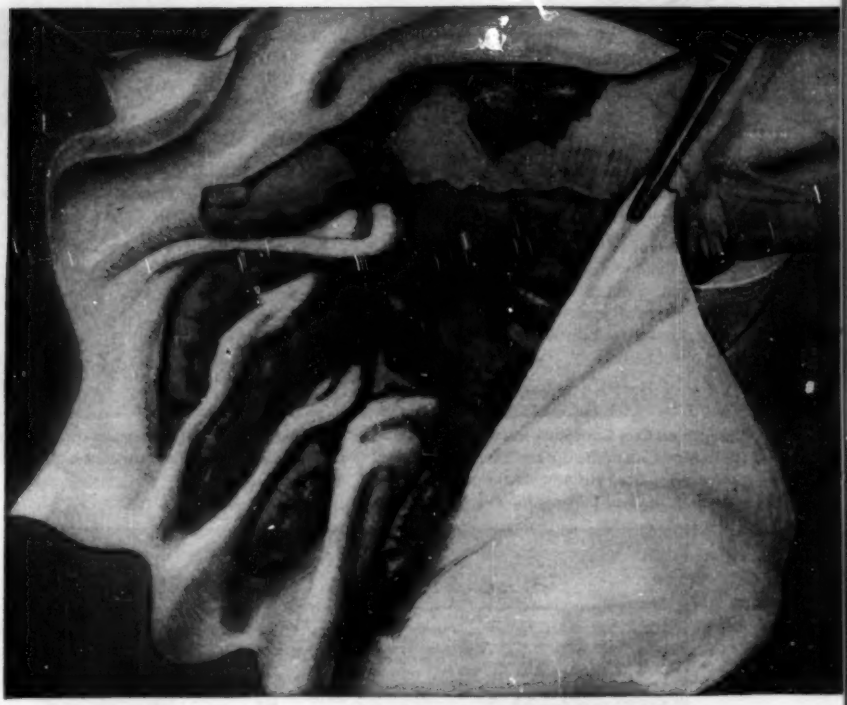

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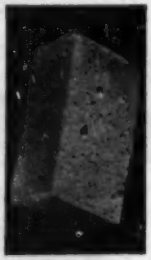
# Plastic Sponge is Framework for Living Tissue

*"Plastic Sponge Which Acts As A Framework For Living Tissue,"* by John H. Grindlay, M.D., and John M. Waugh, M.D., Rochester, Minn. *A.M.A. Archives of Surgery, 63,* 3, Sept. 1951.



Ivalon sponge, a new polyvinyl plastic, has yielded excellent experimental results in surgical procedures, when used as a framework in place of living tissue to fill defects and correct deformities.

In contrast to currently-used foreign materials such as tantalum, vitallium, stainless steel and certain plastics, for surgical reconstruction, polyvinyl sponge acts as a framework into which living tissue grows. Initial results on dogs and human beings offer great promise for further widespread use. Its immediate use for huge abdominal aneurysms seems justified.

● **Experimental Procedures**—Pure, sterile polyvinyl sponge, molded or cut to fit the defect, was surgically implanted in 37 areas in 28 dogs. The operations included: filling the empty pleural cavity after pneumectomy; replacing a rib section; replacing the right hemidiaphragm and anterior sheath of the rectus muscle; placing a piece of sponge under a breast nipple and between the orbital ridges of the frontal bone; suturing thin plates of sponge to the surface of the ear cartilage.

Some experiments were terminated after one month, some between six and eighteen months, and some are still in progress. In almost all cases, the sponge did not become fixed to surrounding tissue, although blood vessels and connective tissue grew into it. Gross and microscopic examinations of the excised sponge and surrounding tissues showed no evidence of inflammatory reactions, with recognizable cellular tissue fitting into spaces not occupied by sponge substance.

● **Lung Surgery**—Polyvinyl sponge, by setting up a fibrogenic reaction, can prevent the spread of infection into the extrapleural space, often a serious outcome of extrapleural plombage for tuberculosis. The sponge is shrunk about 25 percent by boiling and trimmed to fit the cavity. The lung is stripped, the plastic sponge packed firmly, and the cavity closed without drainage.

Polyvinyl sponge was employed in 17 plombage operations on 14 patients to fill the space some time after extrapleural pneumothorax, and as a prosthesis following resection. In most cases bacilli rapidly disappeared from the sputum. (A. Hurst, *et al., Diseases of Chest, 20,* 2, Aug. 1951, 134-138.)

● **Abdominal Aneurysms**—Polyvinyl sponge has been successfully used to reinforce large abdominal aneurysms since April, 1950. Four cases to date have been successfully treated by placing sheets of polyvinyl sponge between the aneurysm and peritoneum. Since no other surgical procedure can be used in these cases, and since this operation is simple and without undue strain on the patient, its use appears justified at this stage.

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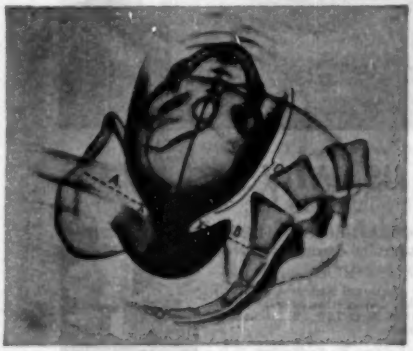

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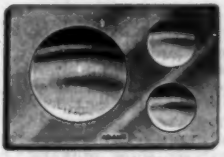
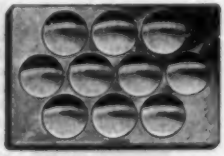
Adaptation of cardiolipin antigen to the Mazzini technic will be found in *Journal of Immunology, 66*, 2, Feb. 1951, 261-275.



*For spinal fluid*



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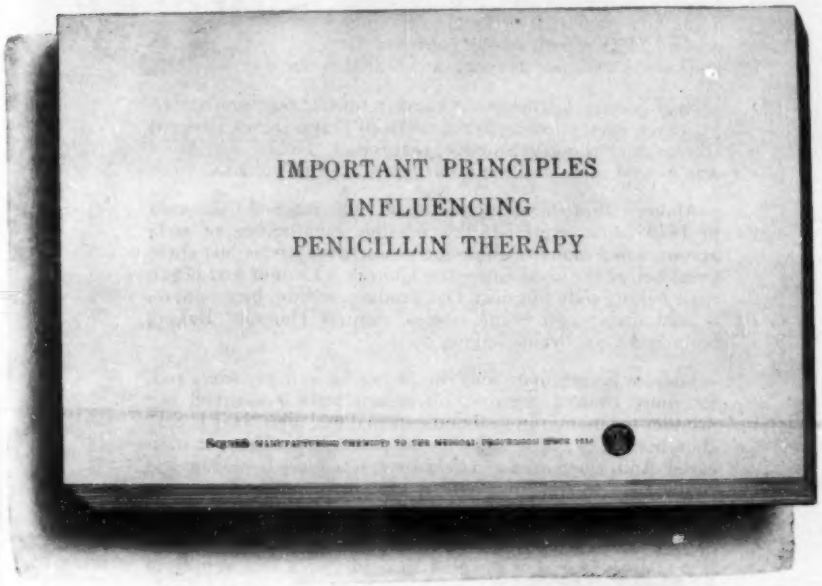


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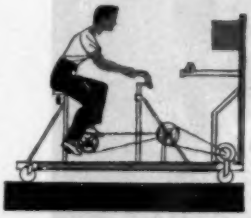

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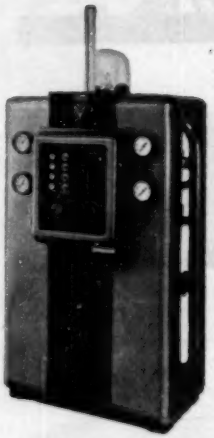

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American Journal of Public Health
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Volume 42 February, 1952 Number 2

# Civil Defense from a Health Officer's Viewpoint*

HAROLD D. CHOPE, M.D., DR.P.H.
*Director, San Mateo County Department of Health and Welfare, Redwood City, Calif.*

THE local health officer's view of civil defense is really a worm's-eye view. He is on the bottom of the stack and has a hard time trying to see any light in the sky through the confusing galaxy of coördinators, chiefs, and directors who are attempting to help him from the local, regional, state, and federal levels.

He is also in the middle with the administrative hierarchy grinding out manuals, directives, plans, estimates, annexes to the plans, revised plans, missions, and promises on the one hand, and on the other the medical profession, the nursing profession, the Red Cross and other voluntary agencies, the pharmacists, first-aiders, hospital administrators, local housing, supply, transportation, and communications chiefs all looking to him for specific, clearly worded directives and an intelligent workable plan to coördinate all these various disciplines when and if "A-Day" comes.

He is confronted by an attitude of the general public which varies from deep apathy when the war news is good to near hysteria when Mr. Truman announces that other major powers have just shot off another atom bomb. He is also backed by the obvious apathy of a Congress which refuses, or fails, to vote adequate funds to support civil defense.

The local health officer is supposed to organize all these groups, attend regular meetings of the Regional Health and Medical Services Section (usually a day at a time), transmit and interpret these meetings to his local civil defense council and to his professional colleagues in additional meetings (all at night), and to plan dry runs without any supplies or money to date. Even postage and telephone calls must come from the local health officer's usually meager operational budget. The local health officer must consult with his public health engineer, his director of public health nursing, and other staff and they, in turn, must spend hours working out details in their special fields. At the same time, he is expected to carry on a sound, pro-

* Presented before a Joint Session of the Conference of State Sanitary Engineers and the Engineering Section of the American Public Health Association at the Seventy-ninth Annual Meeting in San Francisco, Calif., November 7, 1951.

gressive public health program as though he had no responsibilities in the field of civil defense.

Let me give you an example of why a local health officer tends to become confused and fatigued in this field. San Mateo County lies just south of San Francisco and is the only land connection to San Francisco, a target area. It is a small county of only 448 square miles and has about a quarter of a million population. We have three major hospitals and two small hospitals, totaling 554 beds. To serve our population and these hospitals, there are 248 physicians practising in the county. The first directive from our regional office was that San Mateo was to supply 62 first-aid teams requiring the following personnel, according to AG 11-1:

| | |
|---|---|
| 124 | Doctors |
| 186 | Dentists |
| 186 | Nurses |
| 124 | Pharmacists |
| 930 | First-aid workers |
| 372 | Clerks |
| 9,302 | Litter bearers |
| 496 | Ambulance drivers |
| 11,720 | Total |

We were also instructed to have available within the county 2,000 hospital beds. This seemed like a large order at the time—to quadruple our bed capacity and care for seriously injured casualties with only six doctors per 100 patients. Later, a new directive came down stating that we were to be prepared to take care of 10,000 casualties. This confused us on the local level, so we wrote to the regional office asking how, with proper respect to propriety, we could put 10,000 casualties in 2,000 beds or was one of the estimates in error, and, if so, which one. We never did get an answer in writing, but it was decided in conference that we should have available 7,500 beds to receive 10,000 casualties. When we pointed out that this would leave us 1.6 physicians per 100 beds, we were told not to worry, as mutual aid would supply all of our deficiencies. Finally, about six weeks ago a medical chief was appointed for the regional office and a new study and assignment made which gives us in San Mateo County an assignment of 30 first-aid teams and 5,600 hospital beds. With two doctors per first aid-team and 42 per 500-bed hospital, this requires 530 doctors, which is just 113 per cent more than we have. The same personnel shortage applies to every other professional category—nurses, laboratory technicians, x-ray technicians, nursing attendants, trained first-aides, and so on down the line.

Our local inadequacies in meeting personnel requirements for public health teams are even more dramatic.

Despite the fact that local health officers become confused, irritated, fatigued, worried, frustrated, and concerned in trying to deal with this mammoth problem, I feel it was wise to place the responsibility in the hands of state and local health officers, as outlined by Dr. Norvin C. Kiefer at the St. Louis meeting of this Association.

Civil defense is very much like childbirth. It is very painful while you are going through it, but very necessary for the preservation of the nation. We need not review all the reasons for a civil defense organization. These reasons are lucidly stated in all the federal, state, and regional materials. What I would like to do is to try to evaluate some of the intangible benefits and compensations that have accrued from the work thus far put into civil defense by local health officers.

1. *Working relations have been improved.* Formerly the health officer was one public official in a group. His relationship with the sheriff, the county fire warden, the county engineer, the radio operator at the sheriff's office, was cordial but not intimate. Each had his problems in his own field and rarely had

to seek the assistance of the other official. But, with the enormity of the problem of civil defense, these officials are brought together in frequent meetings and find that each has an important contribution to make to the joint effort. The health officer finds that his stocks seem to go up as other officials begin to appreciate that upon his ability to organize and administer may rest the lives and safety of thousands of people, and that his service is as important as or more important than communications, rescue, fire control, police protection, or transportation in the face of a war-caused disaster. He finds himself on a new, sincere, and satisfying first-name basis with many of his associates in the courthouse and discovers that this new relationship carries over into the administration of his peacetime duties.

2. *Professional relationships have been solidified.* In California in general, and in San Mateo County in particular, the relationship between the health department and the clinician has always been good. The willingness of organized medicine to coöperate and to contribute to the civil defense effort has been nothing less than outstanding. Our state medical society has held several excellent conferences on the clinical aspects of atomic warfare. Local physicians have been willing to devote untold hours to meetings and discussion in an effort to work out a reasonable plan for medical defense. Dr. George Uhl, health officer of Los Angeles City, recently made the following cogent statement in a paper on civil defense organization in Los Angeles:

> The Los Angeles County Medical Association is spending many hundreds of dollars every month paying the expenses of the required secretarial help, purchasing stationery, stamps, etc., paying for telephone calls and many other items necessary for the activities of the planning group. This is a civic obligation, but there are no public funds available. It is rather the reverse of the modern philosophy of political science as advocated in Washington. This philosophy is that government should take over the management of medical practice. In this situation, the private practice of medicine has been forced to assume obligations that rightly are those of government.

Private physicians have long looked to the health departments for advice in certain fields, such as communicable disease control, tuberculosis, vital statistics, and laboratory diagnosis. Under the pressures of civil defense, they look to the health officer for assistance and direction in fields related to all the practice of medicine. This is particularly true when the pattern established in my county is followed, in which the health officer is made chairman of the civil defense committee of the county medical society.

3. *Jurisdictional frictions have been diminished.* In the early days of civil defense organization, the fears and jealousies and even local selfishness of cities versus counties, one county versus a neighboring county, the big metropolitan areas versus the smaller jurisdictions, were most disturbing. Great hesitation over signing mutual aid agreements, unending petty arguments over who would do what when, and who would pay for the service, delayed local civil defense organization for months. Now one finds these reservations nearly obsolete. City and county civil defense coördination councils have been formed and are functioning smoothly. County supervisors and city councilmen, mayors, city managers, and county managers work together toward a common goal. This is a major accomplishment.

4. *The demands for a civil defense organization have spotlighted our woefully inadequate public health staffing.* No one would expect a health department to have sufficient personnel to handle a war-caused emergency. But the fact that many health departments do not even have enough personnel to

fill the key positions in a civil defense organizational plan has forcefully brought to public attention the need for improving in quality and in quantity the public health staffs of local jurisdictions.

*5. The health officer discovers unbelievable hidden potentialities in his population.* Nurses, engineers, laboratory technicians, x-ray technicians who are no longer active in their fields or are employed outside of the county, come forth to offer their services. There are ten officers of the Public Health Service living in San Mateo County, all of whom have volunteered to be of any help they can in perfecting our organization, even though they might not be available at the time of disaster. The voluntary agencies have come forth to help, being willing to subjugate their identity in an over-all organization.

As a result of trying to develop a civil defense organization, other multiple intangible benefits to the health department might be presented, but from my experience the five I have mentioned here are the major sources of satisfaction to the local health officer.

There is only one final point I would like to emphasize and reëmphasize, and that is that we local health officers must not forget the woe, worry, and work which has gone into our civil defense organization. If the time should ever come when our nation is not threatened by the danger of war-caused disaster, it would be nothing short of criminal to allow to lapse all that we have accomplished in this particular field of community organization. The advantages which I have listed can apply to a peacetime disaster program just as well as they apply to the organization for a war-caused disaster. Although I do not advocate making disaster planning a seventh point in the standard public health program, I do feel that it should be an obligation of every local health officer to keep current at least a paper plan for disaster and to bring into his planning and organizing as many community facilities and agencies as possible. That we were so poorly prepared and that it has taken us so long to work out our present plans, I feel, is an unhappy commentary on the foresight of local health officers throughout the nation. We all hope that neither war-caused disasters nor peacetime disasters will overtake our communities, but should this occur, local health administrators should be prepared to provide the essential community leadership to meet the situation.

# Federal Aspects of Health Emergency Planning*

M. ALLEN POND, F.A.P.H.A.

*Chief, Division of Engineering Resources, U. S. Public Health Service, Washington, D. C.*

PLANNING to meet health emergencies on a national scale is a big job. Any detailed discussion of the health emergency planning process as the Public Health Service itself engages in it would take more time than is available on this program. Thorough analysis of health emergency planning activities of federal and national voluntary agencies is far beyond the range of this discussion. Therefore, I will try to sketch only in the broadest strokes the scope of health emergencies that may reasonably be considered of concern to federal agencies. I will attempt also to outline the roles that various agencies are playing in preparing to meet health crises.

Health emergencies may result from unusual meteorological conditions such as floods, hurricanes, tornadoes, or blizzards. They may come about as the result of widespread epidemics or pandemics. In the entire history of this country there probably has been no greater health emergency than the pandemic of influenza that swept the world in 1918. Health crises may follow explosions, forest fires, or conflagrations. The Texas City and State of Maine disasters of recent memory are cases in point. Finally, health emergencies may be provoked by man as an act of warfare.

Whatever the cause of the emergency, the aims of those who must meet it are: (1) to confine the damage, (2) to restore order and provide emergency relief, and (3) to rehabilitate the population and the facilities that serve it. These three objectives commingle and are practically inseparable. However, they fall into a logical timetable.

I should like to illustrate each of these steps in terms of the recent floods in Kansas and Missouri. The situation would be different following an attack on a metropolitan area in which there were widespread casualties and destruction of structures and utilities. It would be different, however, not in terms of the kinds of problems to be faced but rather in terms of the gross quantity of damage.

What, then, were the health emergency problems in Kansas and Missouri during July and August, 1951? They involved the interruption, contamination, and, in a few instances, destruction of water supplies. Sewerage systems including treatment works were severely damaged in many communities. Refuse piled up. Thousands of large animal carcasses needed to be removed from urban areas. Rats and flies and other pests multiplied. Stocks of food were damaged or destroyed. Thousands of dwellings were inundated; many were damaged beyond repair. There were power failures. Communications systems were overloaded and long delays were frequently encountered in getting important messages through. Key personnel were stranded for varying periods

* Presented before a Joint Session of the Conference of State Sanitary Engineers and the Engineering Section of the American Public Health Association at the Seventy-ninth Annual Meeting in San Francisco, Calif., November 2, 1951.

of time. These were the health problems that rose up with the rivers in Kansas and Missouri in the summer of 1951. You are struck, I feel sure, by the omission of reference to casualties and medical and hospital care. No mention is made of these because there were no serious medical care problems.

From reports which are familiar to us all, it is evident that the yeoman efforts of state and local health authorities in Kansas and Missouri resulted in confining the damage so that the public health—measured in terms of morbidity and mortality—did not suffer during or after this disaster. However, the resources of those two great states proved inadequate to cope totally with the health emergency.

At the request of the health officers of the two states, Public Health Service personnel, equipment, and supplies were made available for flood duty. They were drawn from as far east as Niagara Falls and New York City, from the deep South (Atlanta, Ga., and Greensboro, Miss.), and from Pharr and Tyler, Tex. I point this out for two reasons: (1) Even in a comparatively slowly developing emergency involving no serious casualties to health services personnel or the public generally, the state health authorities requested outside aid; and (2) the assistance had to be assembled from various points in the East, South, and Southwest. Disaster planning activities of the PHS Communicable Disease Center helped to make immediate assistance available.

What were the steps taken to meet this particular health emergency? First, estimates of damage and necessary emergency action were made by the state health authorities. Plans were made on the scene for preventing disease that might result from sanitation failures and as soon as possible these plans were put into effect. This phase represents the first objective: to confine the damage. The second step in the operation involved restoration as rapidly as possible of basic utilities and services. Again, aid—both financial and material—was sought from outside the affected states.

Almost immediately upon realization of the magnitude of the disaster, the President of the United States, invoking the provisions of P.L. 875 (81st Congress), asked the Congress for and was granted funds to assist the people of the area to meet the crisis. At the same time, the Housing and Home Finance Administrator was appointed by the President to coördinate federal flood relief activities in the area. Within a day or two, delegations from affected communities and states came to Washington to report conditions and to seek help in the rehabilitation or third phase of the program.

What were the functions of the various federal agencies in this disaster relief operation?

We have already sketched briefly the activities of the Public Health Service. In addition, the Food and Drug Administration assigned personnel to the area. They embargoed all food, beverage, drug and cosmetics stocks which had been in contact with flood waters or had otherwise been affected by the disaster. Only after they, or health department personnel, had supervised the salvage operation were damaged stocks released from the embargo. This action tended, of course, to confine the results of the damage, since potentially harmful foodstuffs were kept out of commercial channels, both within these states and outside the area.

The Department of Agriculture Extension Service provided assistance in cleaning up farm homes and in protecting animals against animal disease hazards traceable to the flood. The Soil Conservation Service, among other activities, helped farmers to rehabilitate their wells, both for domestic and animal use.

The Department of Defense aided in

the evacuation of persons from flooded areas; provided spray crews; and provided air transport for PHS supplies and equipment. One of the major contributions of the Corps of Engineers related to its highly efficient handling of the cleanup effort. Mentioned here are only those activities that contributed to health protection.

The National Production Authority took prompt action to make critical materials available so that water works and sewerage systems could be repaired and restored to service as quickly as possible. In this connection a PHS engineer officer was named *pro tem* as the Kansas City representative of the NPA Division of Water Utilities.

The federal agency activities that have been enumerated relate essentially to phases one and two of the flood relief program. The third phase (i.e., permanent rehabilitation) started as the flood waters receded. Sanitary engineering works that needed rehabilitation as a result of the flood were eligible under certain conditions for federal financial assistance available through the Housing and Home Finance Agency. At this stage in the disaster relief program the PHS stepped aside, since the President had placed responsibility in the Housing and Home Finance Administrator for all direct federal financing of community facility rehabilitation.

The flood which we have been discussing was the first major disaster that occurred after the enactment of legislation (P.L. 875) aimed at providing a framework for coördinated action by federal agencies in support of state and local governments faced with peacetime disasters. Although there had been some preliminary planning for such an event, planning for interagency activities at best is difficult, time-consuming, and not exactly exciting to most professional people. Planning for the unknown is especially trying. However, experience gained during the past summer should serve as a basis for more intensive planning of disaster relief activities by the various federal agencies.

## CIVIL DEFENSE

My remarks so far have been aimed at developing the idea that disasters from whatever cause have common basic characteristics. Hence, I have purposely avoided reference to the health emergency planning functions of the Federal Civil Defense Administration, whose responsibilities are concerned primarily with preparations for coping with disasters caused by enemy action against the homeland.

There are two major health problems of concern to FCDA which are of somewhat less urgency to planners concerned with peacetime disasters. Reference has been made repeatedly to the magnitude of the casualty problem that would follow on the heels of an atomic attack. In this respect, the FCDA staff must plan for casualty services on an almost incomprehensible scale. Second, the diabolical weapons of modern war that can be used either covertly or openly against the civilian population represent another complexity in health emergency planning.

It is not necessary to extend these remarks in order to describe what you already know: Even though responsibility for civil defense activities rests in state and local agencies, no community —indeed, no state—is able to muster all the supplies, equipment, and personnel that would be needed after a major attack on any metropolitan center. Furthermore, it is clearly necessary that the federal government sponsor most of the research that is needed to learn how to cope with the new anti-personnel weapons which a determined enemy can use against civilians.

Is it not significant that the Congress, in appropriating funds for civil defense, has placed special emphasis on the stockpiling of medical and health supplies, on

research into defense against special weapons, and on training?

With respect to activities in the health services and special weapons defense field, it should be realized that FCDA is working closely with several federal agencies, including the PHS and other constituents of FSA, the Department of Agriculture, the Atomic Energy Commission, and the Department of Defense. However, primary federal responsibility for these activities remains with FCDA.

Of special interest to sanitary engineers will be the manual *Emergency Repair and Operation of Water Facilities in Disaster*, which is scheduled for early publication by FCDA. Manuals on other aspects of disaster sanitation are in preparation. The PHS has worked closely with FCDA on technical aspects of the new or revised publications.

### POST-DISASTER RELIEF AND REHABILITATION

When the Federal Civil Defense Act of 1950 was passed, there was no doubt that Congress intended it to provide statutory authority for the creation of a separate agency to deal with *civil defense*, extending over the immediate period of the emergency. There remains a need to establish the framework within which the federal government may operate to provide financial and other assistance for the rehabilitation of war-damaged communities.

Several proposals have been discussed in special committees of the Congress during the session closed in 1951. Needless to say, in the discussions of this Association the health and sanitation needs of war-torn communities are being considered, along with all the other aspects of community living. Within the PHS, an *ad hoc* committee was created some months ago by the Surgeon General to begin necessary staff work relating to a rehabilitation program. The magnitude of the relief and rehabilitation problem in European countries is a gauge of the potential problem in this country. One cannot contemplate it without being awe-struck. I emphasize to you that it is a major problem facing our federal health emergency planners. Indeed, the Health Emergency Planning Unit in the Office of the Surgeon General of the Public Health Service is devoting a major share of its efforts to consideration of problems of this type.

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## Second National Cancer Conference in Cincinnati

The American Cancer Society, the National Cancer Institute, and the American Association for Cancer Research as joint sponsors have announced the Second National Cancer Conference to be held at the Netherland Plaza Hotel in Cincinnati, Ohio, March 3–5.

The meetings are open to all physicians and to other professional persons connected with the cancer control program. They represent an opportunity to review the present status of clinical cancer and of cancer research, especially pointed up for teachers in medical schools and physicians in private practice.

The program is oriented toward the wide social responsibility of professional persons in cancer control. Featured speakers from abroad will include Dr. Alexander Haddow of London, England; Dr. Alexander Lipschutz of Santiago, Chile; Dr. Robert McWhirter of Edinburgh, Scotland; Dr. Antonio Prudente of Sao Paulo, Brazil; Dr. James C. Lees of Edinburgh, Scotland; and Drs. E. S. Horning and D. W. Smithers of London, England.

# What an Eastern State Is Doing in Civil Defense Sanitation*

CLARENCE I. STERLING, JR., F.A.P.H.A.

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IMMEDIATELY following the declaration of a state of emergency by the President, His Excellency the Governor, Paul A. Dever, declared an emergency to exist in Massachusetts, and the Civil Defense Agency was formed under the authority of Chapter 639 of the Acts of 1950. By executive orders the duties under civil defense were assigned to several departments of the state government and the state was divided into nine regions for the operation of civil defense. The Department of Public Health was charged with the operation of the Medical and Health Division. The Medical and Health Division was divided into 12 sections, one of which is that of Environmental Sanitation. The writer was designated as Chief of the Environmental Sanitation Section. Its functions are as follows:

DIRECT RESPONSIBILITY OF THE SECTION ON ENVIRONMENTAL SANITATION

a. Maintenance or restoration of water supplies, plus safe treatment of temporary emergency water supplies.

b. Maintenance or restoration of sanitation standards in disposal of sewage and solid waste. This might have to be accomplished despite the loss or diminution of water supply.

c. Control of rodents and insects which carry disease, destroy food, or become serious general nuisances.

d. Development of garbage and refuse disposal emergency procedures.

*Assistance to the Section on Biological and Chemical Defense—*

e. Decontamination measures relating to biological and chemical warfare.

*Assistance to the Section on Monitoring—Decontamination of Radioactive Supplies and Areas—*

f. Decontamination measures relating to radioactive materials.

*Assistance to the Section on Food and Nutrition in Food Sanitation—*

g. Adequate food sanitation inspection during emergency, especially the inspection of emergency kitchens and canteens, as well as of foods which may have become contaminated through the effects of atomic, biological, or chemical weapons.

h. In anticipation of the possible impairment of local pasteurization plants, extension or revision of existing milk sanitation regulations.

*Assistance to the Civil War Aid Defense (Department of Public Welfare)—*

i. Regulation of sanitation in shelters and emergency billeting facilities.

The Section on Environmental Sanitation has been organized with an advisory board consisting of representatives of various state agencies other than the department; private agencies representing water and sewage works and pest

* Presented before a Joint Session of the Conference of State Sanitary Engineers and the Engineering Section of the American Public Health Association at the Seventy-ninth Annual Meeting in San Francisco, Calif., November 2, 1951.

control associations; private consulting engineering firms and suppliers of materials; and also representatives of municipal water supplies.

In each of the nine defense regions an Environmental Sanitation Section has been organized. Regional sanitary consultants have been appointed by the director of civil defense, and the sanitary engineers and sanitary officers (sanitarians) of the Department of Public Health are assigned as advisers. In view of the fact that this country is not actually at war but is in a stage of the so-called "Cold War," the present defense emergency differs from that covering the period of World War II. As the "Cold War" may continue for an extended period of time, it soon becomes apparent that in the field of environmental sanitation, civil defense has to be integrated into our everyday living. The organized civil defense agencies will take over in the event of an emergency. The regular agencies of the state and other governmental units, however, have to function in advance of emergency in regard to planning, development and training.

Our public water supplies are of prime importance in case of any disaster. We have the problem of properly guarding them to protect them against sabotage. We have the problem of supplying an adequate amount of water, in case of emergency, to fight fires and to provide water for public health purposes.

In Massachusetts we are taking certain precautionary measures in our effort to integrate civil defense into our daily water works practices. In the first instance we have set up a program of more frequent sampling of public water supplies in the critical defense areas in order to detect biological contaminants that might be added to the water supplies as a method of sabotage. Many of these biological contaminants will not be detected by the coliform test. Therefore, our routine bacteriological examination of water is not a sufficient safeguard to inform us of biological contamination. We have been developing at our Lawrence Experiment Station routine examinations of the amount of organic matter in the water through the measurement of oxygen demand by using the oxygen-consumed and chlorine-demand tests. This is being done at the present time primarily to give us background information on the normal organic content of the water, in order that we may detect the addition of biological contaminants. All the samples collected for bacterial examination of the water supplies located in critical defense areas are now subjected to a radiological test at our experiment station. This is giving us necessary background information so that we will be in a better position in event of an atomic bomb burst to determine whether or not the water supplies have been contaminated with radioactive materials.

In addition, we have also initiated a program of inventory of the equipment in the local water departments. This is being done on a regional basis and, in fact, is more of a form of self-appraisal for the local water department officials. All these measures are being carried on as a part of the daily routine of the State Department of Public Health.

The Environmental Sanitation Section, in so far as civil defense is concerned, is charged with the training of the regional and local civil defense personnel in emergency measures relating to water supply, milk and food sanitation, sewerage and sewage disposal, garbage and refuse disposal, the control of insects and rodents, housing sanitation, and decontamination of areas and supplies which may be contaminated by chemical, gaseous, biological, or radiological sabotage or attack.

The Environmental Sanitation Section is now holding a series of emergency two day water works schools for the top officials of the local departments.

These schools are being held in each of the nine civil defense regions. The program includes lectures and demonstrations relating to predisaster planning and training of regular and auxiliary personnel of the water departments; various aspects of radiological, bacteriological, and chemical warfare; the development of a coördinated program of action in event of disaster; and the significance of laboratory results. Great stress is placed upon emergency chlorination measures, and demonstrations of emergency chlorine equipment that can be made available in almost any community form a part of the course. In fact, one whole day is taken up with this type of demonstration.

A manual has been prepared on emergency water supply sanitation for use in the water works schools. The plan is that at the conclusion of the school the officials who attended it will return to their own communities and instruct the local water works employees of the latest thinking in so far as the Civil Defense Agency is concerned on the management of water supply. They will train not only their regular employees, but also auxiliary workers in emergency procedures. It is planned that similar schools will be held on other phases of sanitation for the training of regular and auxiliary personnel.

The funds available for the work of the Environmental Sanitation Section of Civil Defense are limited. The total appropriation made for the state Civil Defense Agency has been but $215,000 to date, of which only a small amount has been used by this section for travel and the purchase of materials for the publication of the emergency manuals.

A Supplementary Budget has been submitted to the state legislature by the Civil Defense Agency which will include the recommendation of the commissioner of public health for some $4,000,000 for medical supplies and equipment and for personnel who will devote their time to civil defense. Pending the appropriation of funds for personnel, the Division of Sanitary Engineering has assigned one associate sanitary engineer and a senior clerk stenographer to the Environmental Sanitation Section of Civil Defense. In addition, it has assigned two sanitary engineers to act as chief and assistant chief of the Section on Radiological Monitoring of the Civil Defense Agency. The services of another engineer have been allocated half time to the Medical and Health Division for the purpose of coördinating transportation.

I believe it is our duty to prepare ourselves as rapidly as possible to handle any type of civil defense emergency, always keeping in mind how much of the specialized civil defense work can be integrated into our daily practices. In that way we minimize the economic loss and wasted time of developing procedures we may never use or that may be revised completely after we have acquired more experience in civil defense.

# Sanitary Engineering Aspects of Civil Defense in California*

ARVE H. DAHL

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OUR total interest in civil defense in California involves not only defense against atomic disaster but sabotage and biological and chemical warfare defense, as well as routine protection of the public health for maximum effort to aid the defense mobilization program. The intent of this paper is not to define completely the scope of our interests or the operational detail with which sanitary engineering must cope. Rather it is desired to present the planning and program development that has occurred to date.

The State of California proceeded rapidly in setting up an adequate civil defense organization early in 1950 and has, we believe, more than kept pace with available knowledge. We have been guided by basic federal references, including *The Effects of Atomic Weapons*, by the Atomic Energy Commission; and, since the end of 1950, by publications of the Federal Civil Defense Administration, namely, Bulletin AG 11–1 of the United States Civil Defense, *Health Services and Special Weapons Defense;* and the general bulletin on civil defense organization, *United States Civil Defense.* From these references have come basic information and suggestions for initiating the development of civil defense organization and planning for adjustment of our normal disaster plans because of the tremendous physical and environmental damage expected from atomic warfare.

Our immediate task is to prepare adequately to take care of atomic disaster by mobilization of all state resources. We are proceeding by developing the necessary civil defense organization to cope with simulated atomic bomb attacks on California. For this purpose, eight target cities have been designated: San Francisco, Oakland, Los Angeles, Long Beach, San Diego, Sacramento, Fresno, and San Bernardino. A primary objective of our civil defense program is to mobilize the resources of communities which can handle these problems best. Every citizen should accept responsibility for what he can handle, but no more. In addition, we must actively protect organizations or individuals, for that matter, from assignments beyond their capacity to perform, lest the success of the whole civil defense effort be jeopardized.

## CALIFORNIA'S CIVIL DEFENSE ORGANIZATION

Civil defense in California is a line organization headed by the Governor. It is facilitated by adequate state law on disaster preparedness and relief, which provides for a State Disaster Council, local Disaster Councils, the State Office of Civil Defense, citizens' advisory com-

* Presented before a Joint Session of the Conference of State Sanitary Engineers and the Engineering Section of the American Public Health Association at the Seventy-ninth Annual Meeting in San Francisco, Calif., November 2, 1951.

mittees, Powers of the Governor, and mutual aid regions for mutual aid pacts to be signed by all cities and counties in the state; it prescribes duties of regular state agencies; and it makes all state and local governmental employees available to civil defense in an emergency through the signing of a state oath. As no area in the state has all the resources required to handle an atomic attack, the mutual aid pact permits intercity, intercounty and inter-regional mutual aid operations. The special citizens' advisory committees to the Governor on each major disaster activity, such as medical and health services, evacuation and welfare, utilities, fire, law enforcement, etc., are provided through the mechanism of the State Disaster Council. The committees are used for guiding the policies and programs developed by the State Office of Civil Defense.

The State Office of Civil Defense operating out of the Governor's Office with W. M. Robertson, Major General, USA (Ret.) as director, has created 12 divisions, each being responsible for a defense service such as medical and health services; and 10 regional offices through which the state program operates. At regional, county, and city levels, complementary services must be provided. These divisions are:

1. Division of Communications and Air Raid Warning Service
2. Division of Engineer Services
3. Division of Evacuation and Welfare Services
4. Division of Fire Services
5. Division of Law Enforcement Services
6. Division of Medical and Health Services
7. Division of Radiological Services
8. Division of Supply
9. Division of Training Services
10. Division of Transportation
11. Division of Utilities
12. Division of Public Information and Education

Time does not permit me to discuss briefly or even enumerate the many excellent and fast-developing county and city civil defense organizations.

### DIVISION OF MEDICAL AND HEALTH SERVICES

The Division of Medical and Health Services is unique in that, while its staff is provided through the funds of the State Office of Civil Defense, the state director of the Department of Public Health is nominally charged with the over-all responsibility for developing the medical and health services. Thus, it has a division responsibility, both in the State Office of Civil Defense and in the State Department of Public Health, the latter being the major state support resource. Organization of the division follows the general pattern suggested in Bulletin AG 11–1, with branches responsible for the development of emergency medical services and hospitalization, public health services, and medical and health supplies. Because of the separate Division of Radiological Defense, there is no branch of special weapons defense. Problems of biological and chemical warfare are assigned to the Public Health Services Branch.

The division staff, headed by Frank L. Cole, M.D., Brig. Gen., USA (Ret.), provides 10 professional positions, including four medical officers, two engineers, the medical supply branch chief, a nursing services chief, a hospital representative, and an analyst.

The sanitary engineering activities of the division are carried out by the Public Health Services Branch. In general, the plans for this branch follow the organization of most health departments, and its activities can be considered as either preventive medical services or environmental sanitation services supported by necessary laboratory services, records and statistics program, and other basic support activities. It has a responsibility to see that wherever an environmental sanitation interest occurs within the program of the State Office of Civil Defense, adequate planning and program are developed. The term "environmental sanitation" has just been

used and will be used throughout this discussion in place of the term "sanitary engineering," not because it indicates a broader field of interest, for we do not believe it does, but because it parallels the organization terminology of the State Department of Public Health.

At each level of civil defense organization—state, region, county, or city—parallel services will be developed. On the operating levels, it is felt that all persons with occupations related to environmental sanitation, including consulting sanitary engineers, water pollution engineers, the personnel of pest control organizations, mosquito abatement districts and others constantly in contact with the health department environmental sanitation program, can provide the necessary additional personnel resources to take care of all responsibilities of civil defense in the field of environmental sanitation. As we become acquainted with the program of each division, it is clearly indicated that sanitary engineers will have key roles to play in several divisions. Responsibilities of the Division of Medical and Health Services in the field of environmental sanitation have been agreed upon and are set forth in the following definition that is serving as a guide for developing California's civil defense environmental sanitation program.

## DEFINITIONS

The definition of the environmental sanitation areas of concern to be considered by the Division of Medical and Health Services in every civil defense organization includes:

1. *Sanitation of emergency medical facilities*—This service provides for supervision or handling of water, waste disposal, and cleanliness problems at emergency medical facilities. Sanitation services should provide trained sanitary engineers, sanitarians, or trained auxiliary workers to handle these services at the time of emergency, as follows:

a. First-aid stations required at the outset for a period of at least one week.
b. Emergency hospitals required for at least a six week period.
c. Existing hospitals required at the outset and on a continuing basis.

2. *Emergency water supplies*—Environmental sanitation must be assured safe basic domestic water supplies for emergency medical facilities, civil defense workers, evacuation and welfare-supervised displaced persons, unaffected resident population, and continuing industries. The need for adequate laboratory services for bacteriological examination of water must be considered, as well as biological warfare and the general concern of possible sabotage. Provision of the water supply is a basic responsibility of the Utilities Division. Sanitation services must:

a. Coördinate with the Utilities Division for emergency supply.
b. Establish water quality controls.

3. *Emergency sewage disposal*—Provision of emergency sewage disposal is required where water-carried sewerage systems fail or sewer lines are destroyed. Service on an emergency basis will be required for emergency medical facilities, evacuation, and welfare-supervised displaced persons, other civil defense units, unaffected resident population, and industry. Operation of existing sewage collection and disposal is a basic responsibility of the Engineering Division. To see that emergency facilities are provided to take care of excreta disposal is a sanitation responsibility. Sanitation services must:

a. Supervise provision of emergency sewage disposal facilities.
b. Routine treatment of emergency sewage disposal facilities with chloride of lime.

4. *Emergency food sanitation*—These activities will involve control of contaminated foods, reëstablishment of normal food supply and processing facilities, and sanitation of mass feeding facilities. Mass feeding is a responsibility of the Division of Evacuation and Welfare. The food industry has the responsibility for providing an adequate supply of food. The environmental sanitation service should provide adequate safeguards for maintaining the quality of food supplies. Advisory services will be necessary to both the evacuation and welfare services as well as the food industry. The following specific services will be required:

a. Inspection and condemnation of damaged

or contaminated food supplies in stores, markets, warehouses, and packing and processing plants.

b. Inspection and regulation of community food and meat supplies.

c. Supervision and control of emergency pasteurization of milk and dairy products.

d. Supervision of food supplies and food handling, mess sanitation, etc., in emergency mass feeding center, emergency shelters, field canteen operations.

e. Inspection of emergency food supplies brought into the area.

f. Reëstablishment or replacement of normal food-processing facilities.

5. *Emergency vector control*—This is the only major sanitation service operational responsibility of the Division of Medical and Health Services for the control of communicable disease. The services required will involve emergency fly and rodent control, and in areas of the state that are normally endemic for rodent-borne disease, careful consideration must be given to ectoparasite control.

6. *Service to Division of Evacuation and Welfare Services*—The Evacuation and Welfare Division supervises the displaced persons program—emergency mass housing centers, evacuation and reception centers, and other emergency facilities. Our environmental sanitation concern requires supervision and inspection of sanitation as it relates to the preceding five functional sanitation programs.

7. *Industrial sanitation*—This area of concern involves protection of the environment from industrial materials in the event of disaster. Many manufacturing chemicals can pollute underground water reserves. This program must be tied in with the plant safety and protection program.

## ENVIRONMENTAL SANITATION PROGRAM DEVELOPMENT

With the basic civil defense organization development well along and our responsibilities generally agreed upon, we are at the threshold of the actual job of developing an adequate state-wide civil defense environmental sanitation program. Preparations for this phase of activity at the state level include: agreement on the areas of concern with other divisions of the State Office of Civil Defense; development of an operational manual for civil defense environmental sanitation procedures and policies; working with health department environmental sanitation personnel on how to serve as catalysts to make this program possible; and development of plans and material for the training of auxiliary personnel.

Actually, we do not expect to complete all preparations before working with local civil defense units. The areas of concern that have been defined have been included in the mission assignments given to each regional Medical and Health Services chief. Programs developed in key local civil defense areas promise to serve as a state-wide pattern. Perhaps the most significant work in this respect has been the coöperative work with the food industries in Los Angeles and in Oakland. They have positive working programs on civil defense in operation with the dairy industry, the meat-packing industry, and others which will enable the industry to cope with food supply problems, giving adequate attention to environmental health considerations, in the event of disaster.

While there has been general agreement with the other divisions on our areas of concern, details are yet to be completed. At our request, the Utilities Division has appointed a three man committee which will work with a committee from the Medical and Health Services Division to agree on basic policies and a program for water quality control and domestic water supplies for defense workers and defense facilities, as well as for the remaining resident population. Their major concern, immediately following an attack, will be the maintenance of their system to provide water for fire fighting as well as for human consumption. With the tremendous demand for water in fighting fires and the danger of contamination, we must also be assured of the supply needed for a reduced domestic per capita de-

mand. Because water is such a critical commodity for defense workers, we believe a prearranged working relationship would mitigate many of the problems that might arise during a disaster.

Similar discussions are under way with the Engineering Division, which has primary responsibility for sewers and sewage disposal, and with the Evacuation and Welfare Division, on problems of mass care which involve feeding, housing, and clothing.

To date, little has been accomplished in the way of preparation of operational manuals for civil defense environmental sanitation procedures and policies. Actually, we believe that we have the required basic information available now. In stripping down the problems resulting from an atomic bomb attack, we see that the major effects are equivalent to, or are a combination of, what we have experienced in major earthquake, flood, and fire disasters. In addition, the book *The Effects of Atomic Weapons* gives us the guidance necessary for adjusting our experience. This generalization does not, of course, apply to problems of special weapons defense.

Working relationships are being crystallized with key State Department of Public Health personnel so that the civil defense program can be guided by the same staff now having official responsibility for one of the defined areas of concern. With the aid of this staff, and as requested by local civil defense programs, training programs will be developed. Already, several radio talks have been given on civil defense and environmental sanitation which have been carried by all stations in the state. In Los Angeles, Charles Senn, Engineer Director of the Bureau of Sanitation, Los Angeles City Health Department, has produced television shows instructing families on how to take care of sanitation problems around the home. The education of the public in sanitation procedures is one of our key objectives.

## CONCLUSION

It is our conclusion that civil defense, to be effective, must be considered largely a local operations program; and, from a state level, we must be prepared to provide necessary technical guidance and coördination to make this program effective. To permit mutual aid to work, all programs must be generally uniform in organization as well as in content of program, which further expands our responsibility. Finally, sanitary engineers must consider their broadest field of interest and must make sure, regardless of how responsibility is assigned in the Office of Civil Defense, that an adequate program is developed.

# Sanitation in a Local Civil Defense Program*

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MUCH of the time and energy of local health officers is being devoted to organizing emergency medical services for civil defense. Local health officers also have a key role in developing defense against biological warfare. If the health officer is to accomplish his many tasks successfully, he must have on his staff a competent municipal public health engineer or sanitation director to whom he can assign full authority and responsibility for developing and handling the environmental sanitation program. It is understood that the health officer will give general broad direction and guidance to the program; and that he will review and approve all major plans before they are submitted to the local or area director of civil defense.

There has been a tendency to semi-militarize administration of civil defense. For instance, the municipal public health engineer can normally phone the water department's sanitary engineer and on a friendly, first-name basis settle mutual problems. In civil defense, however, there is apt to be a civil defense administrator in the line of command between these engineers and their department heads. Departmental policies may require that all civil defense matters go through department and area civil defense "channels."

This formality is likely to stop completely or greatly retard essential planning. We found ourselves in such a position when our Los Angeles sanitary engineering staff asked for answers to questions like these:

Who is arranging for tank trucks to haul emergency water supplies?

How will the tanks be cleaned and sterilized? What chlorine residual is recommended?

Who is locating emergency sources of water supply? Where will the location of such supplies be listed?

Will the fire department actually, as rumored, be allowed to pump polluted river water, or even sewage, into the water mains?

Where will the garbage be disposed of if normal disposal facilities are inoperative?

What are the channels for supervising the sanitation of emergency food distribution and mass feeding? Mass housing?

These are but a few of the questions which require answering. In a memorandum to Dr. George Uhl, our Health Officer, we suggested that we be authorized to work out the answers with other interested departments. We frankly stated that we doubted the civil defense director would ever find time to work out solutions individually, in view of his many other duties. In a remarkably short time our memorandum was returned with the health officer's, the civil defense director's, and the Civil Defense Planning Board's approval.

This freedom of action on an informal basis resulted in the heads of the fire, water, and health departments authorizing personnel at the operating level to work together in answering their mutual questions. The fire department repre-

* Presented before a Joint Session of the Conference of State Sanitary Engineers and the Engineering Section of the American Public Health Association at the Seventy-ninth Annual Meeting in San Francisco, Calif., November 2, 1951.

sentative explained a directive in which his chief had instructed all personnel that under no circumstances should polluted water be pumped into drinking water lines. He also presented a complete listing of all emergency water supplies, even including private swimming pools (a formidable list for Hollywood). Several other questions are being answered at similar informal conferences.

The amount of time and energy local sanitation staffs devote to civil defense will depend upon the attitude of the top officials of the state, county, and cities. We cannot neglect other important tasks for civil defense unless officially requested to do so. In the California state program, and more recently, in Los Angeles, extra public health personnel have been authorized for civil defense.

For civil defense sanitation in Los Angeles we recently received authorization for an additional supervising sanitarian and assistant sanitary engineer. These positions were granted when the health officer told the City Council's Finance Committee that the budget-makers must decide whether civil defense is of sufficient importance to warrant assigning personnel to do the necessary work.

In the California state program, civil defense is a somewhat separate state function under the state civil defense director. We initially had a similar plan for Los Angeles but have since decided that civil defense must be integrated into all our regular activities. We do need, however, a few employees who can devote all their time to this activity.

Civil defense can become a means of improving our regular programs; a device for spreading public health education. Our first job is to train our own personnel. In Los Angeles this job has been assigned to our regular inservice training staff. We held three initial meetings of the entire sanitation staff. Programs included review of state and local civil defense administrative structures. Each employee was furnished with a copy of the local civil defense and disaster ordinance.

By films, demonstrations, and discussion, the staff was shown blast effects, radiation hazards, and monitoring techniques. Next, all personnel were encouraged to take Red Cross first aid courses given by members of our sanitation staff who had become certified instructors. More specific instruction programs are now being developed. We have decided to proceed with smaller groups so that we can have field demonstrations and exercises.

Our supervisors spent half a day at Red Cross headquarters learning the method of operation of that organization. Our food sanitation supervisor was named an official member of the Red Cross Food and Shelter Committee, to provide guidance on all sanitation problems.

The department's housing supervisor was named official liaison with the Civil Defense Housing and Shelter director. An engineer, after training, was named the department's representative in radiation matters. He will train certain personnel in monitoring food, water, etc.

We have worked out many problems with industry and labor through our Food Sanitation Advisory Committee. This group decided it would coöperate with the Red Cross in emergency feeding. It also decided that much could be gained by organizing self-help civil defense planning committees for each major segment of the food industry. The Milk Industry Committee of Southern California has held dozens of meetings and has developed a written plan covering almost every subject related to the problem of restoring the milk supply after an emergency. The plan takes in the whole area, and political boundaries are ignored. State, county, and city health departments are all working together on the same industry committee. Similar programs are being started by

other food industries including the meat industry.

Training of department sanitation personnel will include supervision of emergency water distribution with instruction in procedures for cleaning gasoline tank trucks so that they can be used to haul drinking water; calculation of chlorine dosages; use of orthotolidine; methods of distribution of food and water at first aid stations and refugee centers.

Simple procedures for improvising toilet facilities and for the burying of garbage and night soil will be covered. Each sanitarian will be considered the potential leader of a group of volunteers. He should have a broad general knowledge of the entire subject of emergency sanitation.

A few specialists and engineers will be assigned to headquarters planning on water, sewage, waste disposal, food supplies, shelter, hospital, and first aid station sanitation, liaison on radiation monitoring and evaluation and similar top problems.

Training of all local health department personnel of an area should be carried out in a uniform manner. All personnel should be provided with uniform identification cards and insignia. These items are important because we must be prepared to utilize personnel interchangeably. All procedures should be uniform because utilities, the Red Cross, the milk and food industries, and other services must ignore political boundaries. During a disaster there is no time for consideration of minor differences in local requirements.

We have appeared on some radio and television programs to instruct the public on its responsibilities in applying emergency sanitation measures. One daytime presentation was so popular that it was repeated on a local large-audience Sunday night television program. The training of volunteers and the public at large in simple sanitation techniques is an essential part of civil defense preparation.

SUMMARY

The sanitation director should be given the duty, authority, responsibility, and facilities for civil defense preparation. Sanitation is a major problem in any emergency. It should not be slighted by the fear or glamour of radiation or by new health department responsibilities for care of the injured.

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# Second American Congress on Industrial Medicine

The American Union for Industrial Medicine has announced that the Second American Congress on Industrial Medicine will be held in Rio de Janeiro, Brazil, in July, 1952, under the auspices of the Government of Brazil. A broad program on the application of medicine and public health in industry is planned, including military, naval, and aviation medicine.

Persons interested should communicate with Professor Dr. Jose Pedro Reggi, Director-General, Calle Arenales 981, Buenos Aires, Argentina.

# Methods of Payment for Physicians' Services in Medical Care Programs*

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## THE PROBLEM

ADEQUATE remuneration of participating physicians is one of the prerequisites for effective operation of a medical care program furnishing direct service and, especially, for maintenance of high standards. Whether such a program is established and administered by a public agency or voluntary organization, whether the funds for its support are raised through general taxation, compulsory insurance, or voluntary insurance, systematic arrangements for payment for physicians' services must be made by negotiation and conclusion of more or less formal agreements between the administrative agency and the medical profession.

The participating physician expects, and is entitled to, a compensation recognizing the long period of professional education, the experience and skill acquired after graduation, the value of his service to both the individual and the community, the time and effort spent on his work, and the occupational hazards of practice. The agency administering the program must assure quantitatively and qualitatively adequate service at the least cost consistent with high standards, and balance the total expenditures for physicians' services with the total funds available for this type of care or for a variety of professional and institutional services.

It is anything but easy to reconcile the justified financial demands of the physicians with the obligation of an agency administering the people's money, whether it be tax funds or insurance contributions. The problem grows more complicated with increase in the total number of both persons eligible for and physicians participating in limited service programs. It becomes highly involved when the majority of the population of a country is covered by one or several comprehensive service programs and maintenance—or improvement—of the economic status of physicians as a group becomes a matter of public concern.

Quite understandably both form and amount of payment will be the subjects of disputes not only between administrative agencies and medical associations but between general physicians and specialists and between various specialists. If a proposal could be discussed strictly on the basis of technical considerations satisfactory solutions could be found without too much difficulty. Such an approach would be futile more often than not. Psychological factors are likely to exercise a paramount influence on the final decision. Fear of the new, of encroachment on their rights, of loss of prestige, of limitation of financial success or of the "entering wedge" induces many physicians to be opposed to any but the traditional fee-for-service method. "Les médecins veulent que la médicine conserve ses bases traditionelles, professionelles et sociales." In a

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score of tongues similar declarations have been made time and again. Bad experience sometimes leads physicians to condemn a method possessing intrinsic value because it has been discredited by poor organization, blundering and stultifying administration or malodorous politics. If a program of public medical care or of compulsory medical care insurance is involved, negotiations may be complicated by distrust of government that may be regarded much like a suspicious character, to be watched carefully or be presumed to be inefficient, if not ready to sacrifice a noble profession on the altar of politics.

### BASIC METHODS

The search for the best method of paying physicians for service under organized programs of medical care has been protracted and intensive in every civilized country. It still continues. Three basic methods have been tried out in the course of centuries: the fee-for-service method, the flat-rate method, and the salary method. All have certain elements in common. They provide for payment for any of the services covered by a program, thereby opening up an important source of income for the physician and reducing the amount of free service and bad debts so often experienced in medical practice. They relate the remuneration of the physician to factors other than the economic conditions of the sick at the time he requests service, in contrast to the sliding scale that makes the *doctor medicinae* a tax collector, taking from his rich patients to give free or low-cost service to the poor. Each of the basic methods possesses distinctive attributes. Each has advantages and disadvantages that must be carefully weighed with due consideration to the circumstances prevailing in a given country, region, or locality.

In evaluating and comparing the financial arrangements, attention must be given to the rate as well as the form of payment, the effect on the type, quality, and quantity of service as well as the time and total professional income of the physician, and to the administrative implications. Comparative studies covering all these points are lacking. Those which have been made have been limited to some factors, particularly the costs.

Publications on the subject are legion, but many are confusing rather than enlightening. The terminology used by agencies and writers is far from uniform and often too vague to permit correct interpretation and valid conclusions. The opinions on the merits of the three methods are sharply divided and often diametrically opposed. It is therefore imperative to define the characteristics of each method as clearly as possible and to know the main arguments advanced for and against it. It should be borne in mind that some of the statements have never been substantiated by scientific investigation. Others have long been disproved by experience but nevertheless reappear regularly and blossom forth like perennials under loving care.

### FEE-FOR-SERVICE METHOD

The fee-for-service method is characterized by three qualities. Payment is based on the type, number, and value of services actually rendered, standard fees or maximum fees are set for each type of service and published in a special fee schedule for a particular program or a generally valid official fee schedule, and the fees are uniform and binding for all participating physicians practising in a certain geographic area or rendering service under a given program. In general the fees are somewhat lower than those ordinarily charged in view of the fact that payment is certain, while collections in other practice usually represent only a certain proportion of the charges. The amount of income which the physician receives is influenced by both the number and kinds of service actually

rendered and the size of the fees.

Adoption of such a system involves determination of the numerous items of service to be included in the fee schedule, assignment of a price to each item, and formulation of rules and regulations concerning the use and interpretation of the fee schedule, the procedures to be followed in submitting bills, and the control of expenditures. Its effective and economical operation depends on the regular and prompt submission of accurate, itemized bills by the physicians and at least the review and audit of each bill and the regular payment of each account by the administrative agency.

In many countries the fee-for-service method is preferred by the physicians and will be readily accepted by them because it is the very system to which they are accustomed by tradition. In the opinion of its advocates it is better suited to the needs and wishes of all than any other method of payment. It affords not only compensation in proportion to effort—taking at least partial account of the work actually done—but wide opportunity to adjust the fees to the value of the services. Moreover, it provides an incentive to give the best care to the patients and thereby serves to strengthen the bond of sympathy and interest between patients and physicians.

The critics of this method point to a number of disadvantages. The system may have merits if only treatment of selected conditions is included in a program, but it is too difficult to operate and too expensive if the scope of service is comprehensive, including preventive as well as therapeutic services and care by specialists as well as general physicians. The emphasis is placed on "the number of acts done" rather than quality, and upon treatment of disease rather than conservation of health. The highly skilled physician is penalized because the fee schedule is too rigid to offer a reward for work requiring special knowledge and experience. The method hinders early referral of the patient to specialists and encourages excessive treatment, unnecessary service, especially surgical operations, or the use of expensive therapeutic procedures, such as injections, because the physician may be guided by fear of losing his patient to a competitor, by the desire to "hold the good will of the patient," or by financial considerations.

It burdens the physician with much paper work—the very thing he hates—and requires a complicated, cumbersome and costly machinery for its administration. Administrative control by authorization and reauthorization of specific services, reviewing and adjusting of bills, or both is inevitable in order to prevent soaring costs with their detrimental effect on the total budget or other services of the program. It may well happen that the payments to the doctor must be scaled down. What the physician finally receives is a product of two administrative procedures, the approval of his own bill and the reconciliation of all approved bills with the available funds. At best, it is what he has claimed and at the worst it is a fraction of his claim. If different programs in the same locality have fee schedules allowing different charges for the same type of service, dissatisfaction and unrest among the medical profession are inevitable.

### FLAT-RATE METHOD

The generic term flat-rate method denotes a variety of specific forms of payment that are alike in two respects: fixed amounts of money are paid regularly and the rates represent average payments that are not related to the number of services actually rendered to the individual patient. The principle of averaging rests on the assumptions that some of the persons covered by a program will require little service and others much and that the total compensation will be in proportion to the total amount of work for all patients.

The basis for determination of flat rates may be (1) the unit of time, taking into account the number of hours, half days or full days actually worked by the physician, regardless of the number of patients seen; (2) the clinic session, taking into account the number of sessions actually held, without regard to the exact number of hours worked or the number of patients examined or treated; (3) the case of sickness or maternity, taking into account the number of cases actually attended, regardless of the type and amount of services rendered; or (4) the number of persons who have chosen the physician for a specified period of time, taking into account the number of persons eligible for service rather than that of the sick, irrespective of the type and volume of services rendered or the amount of time spent. The income of the physician depends on the size of the rate of compensation as well as the extent to which his services are utilized.

In the opinion of its advocates the flat-rate method has advantages outweighing its admitted disadvantages. If amount, scale and range of the compensation are adequate the method stimulates professional competition rather than financial competition. It provides an incentive to prevent illness and treat patients promptly, thoroughly, and economically, as the remuneration remains the same, whether a person is healthy or sick, whether the patient requires much or little service. The physician can rely on a regular and predictable income and is relieved of burdensome paper work, as no itemized bills are necessary. The administrative agency can estimate the probable expenses with a fair degree of accuracy and operate economically, because both computation of amounts payable and control of expenditures involve little in the way of administrative costs. However, the principle of averaging the remuneration is of limited applicability if the system of individual practice of medicine is combined with the method of paying flat rates according to the number of eligible persons or cases of illness.

Under this type of organization the flat-rate method can easily be employed for the compensation of general physicians because of the uniformity and predictability of the basic types of care, but it is not practicable for remuneration of specialists because of the diversity and unpredictability of their services. Quite different is the situation if flat rates are paid to group practice units. Under such an arrangement the organizations receive payment in proportion to the total number of persons who have chosen the group, and the staff members distribute the income according to their own wishes in the form of fees, flat rates, salaries, or a combination of these bases and in amounts determined by more or less formal agreements. This procedure permits recognition of both competence and effort. The potential dangers of relating payment to the number of persons on a physician's list or to the number of cases of sickness attended can be averted by limiting the number of persons or patients to be accepted by a physician or by allowing a higher rate for the first 1,000 persons or cases and progressively declining rates thereafter.

The opponents of the flat-rate method either deny the validity of the arguments advanced by the proponents or question the possibility of making an interesting theory work. Their objections are directed primarily against payment of flat rates according to the number of persons on the individual physician's list or the number of cases of sickness attended by physicians in individual practice. They contend that a limited amount of payment for unlimited service is a temptation to give a little service to many patients hastily and superficially ("rush medicine"), to do indifferent, careless, or inferior work, or to refer as many patients as possible to other physicians,

particularly specialists, or to clinics or hospitals for continued treatment. Thus, the quality of medical care will deteriorate, consistency of service will become a mockery, the time and skill of specialists will be requested unnecessarily and excessively, and the total costs of the program may well increase.

The conscientious physician giving freely of his time or the highly experienced physician performing superior service is certain to lose because he will be overworked and underpaid, while the less scrupulous and less skilled is likely to gain. If only the general physicians are paid flat rates and specialists are compensated on the basis of another method, a host of problems is created. The difficulty of defining the two groups may be overcome but profound disagreement over the wisdom of distinguishing between general physicians and specialists rather than between general physician's services and specialist services will prevent a satisfactory solution of the problem. Combination of the flat-rate method for general physician's services with the fee-for-service method for specialist service requires administrative control procedures greatly reducing the possibility of cutting down administrative expenses. Limitation of the work of the physician by placing ceilings on the number of patients or potential patients frequently is considered an infringement on the right to practise.

### SALARY METHOD

The salary method is distinguished from the two others by the fact that fixed rates of compensation are paid periodically, usually every month, for performance of certain duties by the physician, regardless of the number of healthy or sick persons seen or the number of services rendered. Salaries are paid for part-time or full-time service and often represent net income. The rates are usually set for a year and their size is determined on the basis of qualification, experience, and age and, often also, of length of service under a given program. The total income of the physician depends on the amount of time he devotes to service under a program, his professional status and skill, the salary scale, and the type and amount of additional provisions known as "fringe benefits."

The proponents of this method argue that a guaranteed annual income commensurate with the duties to be performed frees the physician from the necessity of chasing after the elusive dollar and of the temptation to undertake more than he can master or to accept financial advantages for the referral of patients. The physician can devote his whole energy to professional work rather than spending precious time on financial statements, collaborate with his colleagues without fear of losing patients, and keep abreast of scientific progress without sacrificing income. Price competition is eliminated and quality competition encouraged, with resultant high standards of service. Administratively the method is advantageous because it involves no review, audit, and payment of countless different bills and thereby affords considerable savings.

The full-time salary method is opposed on many grounds that stem from the fear the physician would "sell the soul of his ideals for a mess of financial pottage" and lose his liberty for all time. A monthly salary check would kill the spirit of adventure, initiative, and freedom to act and all incentive to be interested in the patient, with the result of grudging response to calls, indifferent or superficial service, and low quality of care. The personal relationship between patient and physician would be undermined, if not destroyed. Appointments and promotions would be made on political grounds. Instead of being servants of the patients, the physicians would be servants of the program, "regimented

units of a system of bureaucratic control," compelled to perform their work at the pleasure of the administration officials and ending up as shabbily treated and underpaid "jobholders."

### SUPPLEMENTAL PAYMENTS BY PATIENTS

Regardless of the method employed for the compensation of physicians, a service program may pay for the full cost of the standard services or for a definite proportion only. Full payment by the program implies that the patient is required to pay only for services desired for his special comfort and convenience, that he must not offer "extra" payment for any of the services covered, and that the physician must neither demand nor accept money in addition to the compensation allowed by the program. Under the system of partial payment by the program the patient may be required to make supplemental payments to the attending physician for specified services according to regulations, or the physician may be authorized to make additional charges with or without obligation to observe limits set in official fee schedules.

Full payment by the program, in the opinion of its advocates, enables the patient or potential patient to heed the advice "see your doctor early before he has to see you" and thereby encourages preventive measures, early diagnosis, and prompt and thorough treatment. It protects the sick against unpredictable, annoying, and possibly burdensome additional expenses and removes the temptation for the physician to raise his charges on the grounds that part of the cost will be paid by the program. It preserves the principle of service in contrast to the principle of indemnification for expenses actually incurred.

Those favoring supplemental payments by patients argue that such a policy prevents abuse of the services and excessive demands on the time of the physician. Without "deterrents" patients would "run to the doctor for every sneeze, sniffle, and headache." The obligation to contribute to the cost at the time service is demanded fosters a sense of responsibility and keeps the total cost of the program within reasonable limits.

Between the extremists there is a school of thought advocating full payment by the program for all "necessary" professional services at the office, clinic, and hospital; and partial payment for home visits in general or under particular conditions, for drugs and appliances other than those declared "essential," and for materials needed for certain diagnostic and therapeutic procedures.

### PRESENT PATTERNS

The extent to which the three basic methods have been employed in the past and the frequency of their utilization at present vary not only from country to country but from one section of the same country to the other and from one type of program to the other in the same geographic area. A few examples will serve to show the diversity of patterns in some democratic countries.

In the United States the majority of all physicians rendering direct service under the various programs of medical care are compensated on the basis of the fee-for-service method, the part-time salary method, or the flat-rate method, in this order of frequency, and the minority hold full-time salaried positions. In Great Britain, where all but a small number of physicians are participating in the National Health Service, most of the "general practitioners" are paid flat rates per person on their lists and all specialists receive salaries for part-time or full-time work under the program of public medical care. In Denmark, where practically all physicians render service under the functionally coördinated extensive systems of public medical care and compulsory

insurance against sickness costs, the large majority of all general physicians receive fixed annual amounts for every person on their lists and supplementary fees for certain services, such as night calls; most specialists hold full-time salaried positions in hospitals; and a small minority of general physicians and specialists are paid on the basis of the fee-for-service method. In Norway, where almost all physicians participate in the large-scale system of compulsory sickness insurance operated in conjunction with extensive provisions for public medical care, the physicians who are not on the staff of a hospital bill the insured patients according to an official fee schedule and the insured is reimbursed for the larger part of the cost, while most specialists are paid salaries for part-time or full-time work in hospitals. In Sweden, where a broad system of public medical care is supplemented by subsidized voluntary insurance plans covering general physicians' services, the majority of all general physicians derive the bulk of their income from salaries paid by public agencies for part-time work and from fees allowed by the voluntary insurance organizations. Almost all specialists are full-time or part-time members of salaried hospital staffs.

The variations in the utilization of the basic methods under identical conditions as well as different types of programs in the same country are strikingly exemplified by the situation in the United States. The fee-for-service method is generally employed by certain tax-supported programs, such as the Vocational Rehabilitation Service and the "Home Town" program of the Veterans Administration, by the voluntary medical care insurance plans known as Blue Shield plans, and by the Workmen's Compensation programs. It is frequently used by programs of public medical care covering recipients of public assistance and "medically needy" persons and by Crippled Children's programs for the purpose of paying for treatment. Often the fees for the same type of service requiring the same skill and time vary considerably from program to program in the same area.

Payment of flat rates per unit of time or per clinic session is the prevailing method of compensating physicians for service at diagnostic clinics under the Crippled Children's programs and is not uncommon under the other programs of public medical care. Flat rates per eligible persons are paid by some programs of public medical care for the needy, such as that in Baltimore, and by the Health Insurance Plan of Greater New York which makes per capita payments to the group practice units, leaving distribution of the sums to the affiliated physicians.

The part-time salary method is utilized by at least eight state agencies in charge of Crippled Children's programs for the purpose of compensating physicians for a varying combination of diagnostic, consultative, and therapeutic services and by a number of local units of government employing town, city, or county physicians to render home care, office care, or both to needy persons.

Full-time salaries are paid primarily to physicians on the staffs of hospitals operated as centers of medical care programs, such as those of the Veterans Administration and the U. S. Public Health Service, and occasionally to physicians responsible for home, office, clinic, and hospital care, or only some of these types under programs of public medical care for needy persons, as in Buffalo, N. Y., Cincinnati and Cleveland, Ohio, Louisville, Ky., and Sacramento, Calif. Guaranteed annual incomes, comprising a basic salary and additional payments for full-time service, are common under voluntary group-practice prepayment plans.

### COMMENTS

If the problem of paying physicians for service in medical care programs is

to be discussed fruitfully, the basic conflict arising out of the conception of "medicine as a profession of a cultivated gentleman" (Sir William Osler) must be clearly and fully realized. As R. H. Tawney has said so well, the meaning of the physician's profession, both for himself and the public, "is not that he makes money but that he makes health." Although he enters the profession for the sake of livelihood, "the measure of his success is the service which he performs, not the gains which he amasses." If the physician lives up to professional ideals and strictly observes the code of ethics embodied in the Hippocratic oath he may well conclude his days in poverty. If he acts like a businessman he can acquire a big bank account and a large estate within a few years but will furnish ample ammunition for complaints about commercialism in the system of private practice. A well organized and efficiently administered system of paying physicians for service in medical care programs can markedly reduce the dilemma confronting the possessor of the most humane of arts.

Experience in the United States with the basic methods of payment permits six broad statements.

1. Missionaries by far outnumber mercenaries among the participating physicians. This very fact testifies to the importance of administrative procedures protecting the honest, conscientious, and careful physicians against those relatively few colleagues who, unintentionally or deliberately, cause serious damage to a medical care program by disregarding established standards of service, ignoring the rules for the operation of the plan, or violating the principles of professional ethics.

2. The payments from both tax-supported and insurance programs to participating physicians have multiplied in the last twenty years. They constitute a steadily growing proportion of the total professional income for a continuously increasing number of physicians in private practice and the sole source of support for more than ten thousand physicians devoting their full time to direct service under public programs. Although some physicians in private practice derive substantial, if not huge, incomes from certain programs, especially insurance plans, the average situation leaves much room for improvement. Fully justified criticism is directed against fee schedules lacking the flexibility so necessary for adjustment of fees to services requiring unusual skill; against flat rates and part-time salaries too low and too limited in range to attract or hold competent physicians; and against full-time salaries insufficient to satisfy specialists or unprotected by tenure.

3. If the countless articles in medical journals reflect opinions correctly, most physicians are concerned more over the rate of payment and the total income than over the form in which they are compensated by a program, provided they are given complete freedom to render service according to their own conviction and to establish and maintain the usual professional relationship with their patients. Almost all programs have adopted specific provisions establishing the principle of professional independence and protecting the patient-doctor relationship.

4. The dollar buys more service, and administration of a program is simpler and more economical, if payment to physicians is made on the basis of the flat-rate or salary methods rather than the fee-for-service method. However, cheap medical care is always costly.

5. To be satisfactory, a system of payment to physicians must encourage adequate service in health and sickness, provide an income related to ability and effort as well as work load, and be easy and inexpensive to administer.

6. No method of payment possesses the magic power of producing high quality of service. Any systematic arrangement for the compensation of physicians must be an integral part of a service organization designed to attain effective teamwork between general physicians and specialists and highest possible standards of medical care.

# The Relation Between Recent Injections And Paralytic Poliomyelitis in Children*

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SEVERAL factors have been suspected of predisposing individuals to a higher incidence or a more severe form of poliomyelitis. Among these may be mentioned trauma,[1, 2] tonsillectomy,[3, 4] fatigue,[5, 6, 16] and pregnancy.[7, 8] Reports of an apparent relation between prior immunization and poliomyelitis were made by DeTeyssien[9] in 1921, and later by Jermulowicz,[10] Molinari,[11] Banerjea,[12] Mazel, *et al.*,[13] Brain,[14] Verjaal,[15] and Russell.[16] These reports were based on observations made in one or several cases. During 1950 a number of British and Australian investigators reported on studies in groups of cases[17-23] which indicated that in children recently inoculated with pertussis vaccine, diphtheria toxoid, or tetanus toxoid the injected limb was more frequently the site of paralysis than was the case in children not recently inoculated. Hill and Knowelden,[24] in a careful statistical study, corroborated these findings. They also observed that a history of recent immunization was obtained more frequently in cases of poliomyelitis than in matched controls and considered it possible that recent inoculations may have shifted some of the cases of poliomyelitis from the abortive to the clinically recognized group. In this country, Anderson and Skaar[25] have confirmed the British observation of a correlation between the site of injection and the site of paralysis.

On the other hand, Breen and Benjamin[26] found that, out of a total of 356 cases under age 5 in the London outbreaks of 1947 and 1949, only 58 had a history of recent inoculation and in only 33 was a real association established between paralysis and injection. They doubted that the association colored the epidemiological picture of the London outbreaks. McLeod[27] studied an outbreak in Belfast in 1950. He obtained data on immunization from 73 paralytic children, of whom 33 had been inoculated at various times before the onset of their paralysis. He was unable to demonstrate a relationship between the site of injection and the site of paralysis; but he admitted that his experience was limited.

## METHOD

The present study includes all cases of poliomyelitis reported to the New York City Department of Health in 1949 and 1950 among children 5 years of age and under from whom an accurate history of previous injections could be obtained. Upon the notification of a case, a complete epidemiological his-

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tory was obtained by a physician within a month of onset. This included the clinical picture, results of spinal fluid examinations, and outcome of the case. In addition, a history of injections received by every member of the family in the age groups studied was obtained. This included the dates of inoculations and types of materials used. A month after onset, cases were revisited by public health nurses, who checked on paralysis. Necessary corrections were entered on the original cards. During 1950, the investigation was extended to include children from 6 to 10 years of age, and the physician also visited a neighboring family in which no case had occurred and obtained a similar inoculation history of all children 10 years of age or under. These histories were used in the selection of a control group.

The data obtained from controls in 1950 were entered on cards and arranged by age and sex. The case histories for that year were similarly arranged. For each case a card was pulled at random from the corresponding control group and the date of onset of the case entered on it. The time span between this assigned date and the date of inoculation provided intervals among the controls comparable to the interval between inoculation and onset among the cases. There were more controls than cases in each group except for age 5, female, and age 8, male. Two controls were lacking in the former and five in the latter. They were obtained from control groups of corresponding age and sex in 1951. Thus, for 1949 and 1950 data were available on the time interval between inoculation and onset of poliomyelitis in the cases, and for 1950 on inoculations and the presumed onsets in the matched controls. The agents used in the injections were also known for both cases and controls.

The data from cases in 1949 and 1950 were arranged by time interval between inoculation and onset. The data for the 1950 controls were similarly arranged. All cases and controls showing an interval of not more than 3 months between inoculation and onset were further checked for accuracy by communicating with the physician who had given the injection and obtaining from his records the dates of and materials used for the inoculations. Confirmations were obtained in about 75 per cent of those questioned. The differences between the statement of the mother and the doctor's records were surprisingly few. Where such a difference existed, the doctor's record was accepted. Where no record was kept by the doctor, the mother's statement was accepted if her reliability was judged to be good. Otherwise the case was not used in the study.

All data were entered on coding sheets and punch cards made. These were processed by tabulating machines.

Since no data on immunization were obtained on children over 5 years of age in 1949, the analyses for the two years are limited to children 5 years of age or under. It should be pointed out that the results apply to the 0–5 year age group, but not necessarily to each year of age in the group. Further analysis is needed to clarify this. Although the figures for the 6–10 year age group are not used in the two year analysis, their inclusion would make no significant statistical change. The discussion of immunization histories in cases and controls is limited to the year 1950 and therefore includes all children aged 10 years or under.

## RESULTS

The total number of cases studied was 1,300, of which 681 occurred in 1949 and 619 in 1950. Table 1 indicates their distribution by age, sex, paralysis, and history of previous inoculation. Of the total number, 879 had received their last injection with DPT, 259 with penicillin, and 117 with other or unknown agents. The term DPT signifies an injection with

TABLE 1

*Cases of Poliomyelitis by Age, Sex, Paralysis, and History of Previous Inoculation, New York City, 1949–1950*

| Age In years | Sex | | | Interval Between Inoculation and Poliomyelitis, in Months | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | 0–1 | 1–2 | 2–3 | 3–6 | 6–12 | 12+ | Not Inoculated | At Onset | Unknown |
| 0–1 | 51 | 39 | 90 | 41 | 11 | 9 | 4 | 3 | – | 19 | 1 | 2 |
| Paralyzed | 48 | 37 | 85 | 39 | 11 | 8 | 3 | 3 | – | 18 | 1 | 2 |
| Not Paralyzed | 3 | 2 | 5 | 2 | – | 1 | 1 | – | – | 1 | – | – |
| 1–5 | 573 | 376 | 949 | 79 | 39 | 32 | 90 | 112 | 516 | 26 | 23 | 32 |
| Paralyzed | 413 | 293 | 706 | 56 | 27 | 25 | 78 | 86 | 375 | 20 | 17 | 22 |
| Not Paralyzed | 160 | 83 | 243 | 23 | 12 | 7 | 12 | 26 | 141 | 6 | 6 | 10 |
| 6–10 | 155 | 106 | 261 | 12 | 4 | 4 | 9 | 26 | 185 | – | 12 | 9 |
| Paralyzed | 84 | 59 | 143 | 6 | 4 | 3 | 6 | 15 | 98 | – | 7 | 4 |
| Not Paralyzed | 71 | 47 | 118 | 6 | – | 1 | 3 | 11 | 87 | – | 5 | 5 |
| Total | 779 | 521 | 1,300 | 132 | 54 | 45 | 103 | 141 | 701 | 45 | 36 | 43 |

diphtheria toxoid, pertussis vaccine, or tetanus toxoid, singly or in any combination. About 41 per cent had received a triple mixture of diphtheria toxoid, pertussis vaccine, and tetanus toxoid; 27 per cent diphtheria toxoid only; 15 per cent pertussis vaccine alone; and 10 per cent a mixture of pertussis vaccine and diphtheria toxoid. Four per cent had been inoculated with tetanus toxoid only, and an equal percentage with a mixture of diphtheria and tetanus toxoids. Thus, about 80 per cent had been inoculated with diphtheria toxoid, 65 per cent with pertussis vaccine, and 50 per cent with tetanus toxoid. The data were insufficient to permit determination of the influence of each of these antigenic agents alone.

There were 132 children injected not more than a month before onset, 343 between a month and a year prior thereto, and 701 more than a year before. In the latter group, information was obtained about the type of injection, but no attempt was made to learn the exact date of inoculation and the limb injected, since it was felt that the information would not be sufficiently reliable. The 36 children who had been injected on the day of onset had received penicillin in all but one case, probably as a therapeutic measure before a definite diagnosis was made. In 43 instances no information was obtained on the interval between injection and onset of poliomyelitis. In the total group there were 779 boys and 521 girls.

It will be noted that in all age groups, by reference to columns 5 to 9 of Table 1, there is a concentration of cases in the month following the last injection, as was pointed out by Anderson and Skaar.[25] Thus, in age group 0–1 year, 41 cases occurred within a month after the last inoculation; 11 between 1 and 2 months; 9 between 2 and 3 months, 4 between 3 and 6 months, an average of 1 per month; and 3 between 6 and 12 months, an average of 1 case in 2 months. Such a concentration suggests a relationship between recent injection and poliomyelitis.

*Injected and Paralyzed Limbs*—Information about the exact site of the last injection was available in 160 children in the age group 0–5 years (Table 2). Of these, 80 had been injected with DPT, 31 with penicillin and 49 with other agents.

Among those inoculated with DPT, 27 had received their last injection within a month of onset of poliomyelitis and 53 between a month and a year before. Thirty-three per cent of the former and 13 per cent of the latter were paralyzed

TABLE 2

*Relation Between Injected and Paralyzed Limb After Inoculation with DPT, Penicillin, and Other Agents, in Children 5 Years of Age or Under, New York City, 1949–1950*

| Agent Used | Interval Between Last Injection and Onset of Poliomyelitis, in Months | Number Injected in Known Site | Paralyzed in Injected Limb | |
|---|---|---|---|---|
| | | | Number | Per cent |
| DPT | 0– 1 | 27 | 9 | 33 |
| | 1– 2 | 13 | 2 | 15 |
| | 2– 3 | 8 | 0 | 0 |
| | 1–12 | 53 | 7 | 13 |
| Penicillin | 0– 1 | 6 | 3 | 50 |
| | 1– 2 | 11 | 4 | 36 |
| | 2– 3 | 2 | 1 | 50 |
| | 1–12 | 25 | 7 | 28 |
| Other agents | 0– 1 | 1 | 0 | — |
| | 1– 2 | 6 | 0 | — |
| | 2– 3 | 6 | 0 | — |
| | 1–12 | 48 | 6 | 13 |
| All agents | 0– 1 | 34 | 12 | 35 |
| | 1– 2 | 30 | 6 | 20 |
| | 2– 3 | 16 | 1 | 6 |
| | 1–12 | 126 | 20 | 16 |

in the injected limb, a statistically significant difference.

Among the children who had received penicillin within a year of onset of poliomyelitis, a similar difference was found between those injected not more than a month before and those injected between a month and a year before. However, the numbers were small and the difference was not statistically significant. Among the 49 children injected with other agents, only 1 had received an injection within a month of onset of poliomyelitis. When all agents were combined, there were 34 children injected not more than a month before onset and 12, or 35 per cent of these, were paralyzed in the injected limb. On the other hand, 126 children had been injected between 1 month and 1 year before onset, and 20, or 16 per cent, were paralyzed in the same limb. The difference is statistically significant.

*Injection into Unspecified Arms or Legs*—In some cases there was information that the injections with DPT had been given in the arm, but whether right or left was not known. The number of these children who developed paralysis in the limbs was ascertained. There were 18 among those inoculated not more than a month before onset of poliomyelitis and 43 among those inoculated from 1 to 12 months before onset. Paralysis of the arms occurred among 56 per cent of the former and 21 per cent of the latter, a statistically significant difference (Table 3).

There were too few children injected with DPT in the legs to permit adequate comparison between the recently and the more remotely injected cases.

All injections of penicillin had been given in the legs. There were 134 children so injected within a year of onset of poliomyelitis. No significant difference in the percentage of paralyzed legs was found between those recently injected and those injected some time before (Table 3).

*Weekly Interval Between Injection and Onset*—When the cases occurring within a month after injection were arranged by weeks, no marked preponderance of cases was noted in any one week. However, in the DPT-injected children some bunching of cases was noted in the 2nd week after injection. Of the total of 55 cases occurring in the 4 weeks after the last injection, 18, or

TABLE 3

*Relation Between Injected and Paralyzed Limbs in Cases Injected with DPT in the Arms and Penicillin in the Legs, Which Arm or Leg Not Specified, in Children 5 Years of Age or Under, New York City, 1949–1950*

| Agent Used | Interval Between Last Injection and Onset of Poliomyelitis, in Months | Number Injected | Number Paralyzed In Limbs | Number Paralyzed in — |
|---|---|---|---|---|
| | | | | *Arms* |
| DPT | 0– 1 | 24 | 18 | 10 (56%) |
| | 1– 2 | 8 | 5 | 1 (20%) |
| | 2– 3 | 6 | 6 | 2 (33%) |
| | 1–12 | 57 | 43 | 9 (21%) |
| | | | | *Legs* |
| Penicillin | 0– 1 | 52 | 34 | 29 (85%) |
| | 1– 2 | 9 | 5 | 4 (80%) |
| | 2– 3 | 8 | 5 | 4 (80%) |
| | 1–12 | 82 | 49 | 36 (90%) |

TABLE 4

*Cases of Poliomyelitis Occurring in the 4 Weeks Following Injection with All Agents, by Days After Injections, Children 0–5 Years of Age, New York City, 1949–1950*

| Days After Injection | DPT | | Penicillin | | Other Agents | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Total Cases | Number Paralyzed | Total Cases | Number Paralyzed | Total Cases | Number Paralyzed | Total Cases | Number Paralyzed |
| 1– 7 | 11 | 9 | 32 | 25 | – | – | 43 | 34 |
| 8–14 | 18 | 18 | 11 | 7 | 1 | 1 | 30 | 26 |
| 15–21 | 14 | 12 | 8 | 3 | 1 | 1 | 23 | 18 |
| 22–28 | 12 | 10 | 7 | 4 | – | – | 19 | 14 |
| Total | 55 | 49 | 58 | 41 | 2 | 2 | 115 | 92 |

33 per cent, occurred in the 2nd week. In the 1st, 3rd, and 4th weeks after the last injection with DPT, there were 11, 14, and 12 cases, respectively. Furthermore, all 18 cases that occurred in the 2nd week were paralytic, while in the other three weeks the paralytic cases were respectively 9, 12, and 10 (Table 4).

Evaluation of the group last injected with penicillin is somewhat complicated. A large number of cases, 32 out of a total of 58, occurred in the 1st week after the last injection of penicillin, most of them in the first 3 days. One wonders whether many of these injections were given therapeutically, after the child became ill with poliomyelitis and before a diagnosis was made. If this is the case, then the apparent adverse effect of recent injections of penicillin noted in some of the tables may not be of any importance. In none of the tables was the difference between the effect of recent and remote injections of penicillin large enough to be of statistical significance. However, even the slight differences may be wiped out if some of the injections were given after onset but before symptoms were sufficiently characteristic for a diagnosis to be made.

The cases injected in a known site in the month preceding onset of poliomyelitis were also arranged by week of onset after injection. The numbers of injected limbs paralyzed in each week were too small to allow the emergence of any particular pattern (Table 5).

*Ratio of Arm to Leg Paralysis*—Since four-fifths of all DPT injections had been given in the arms and all penicillin injections in the legs, it appeared

TABLE 5

*Relation Between Injected and Paralyzed Limb in Cases of Poliomyelitis, by Week After Injection, Children 0–5 Years of Age, New York City, 1949–1950*

| Days After Injection | Number Injected in Known Site | | | | Paralyzed in Injected Limb | | | |
|---|---|---|---|---|---|---|---|---|
| | DPT | Penicillin | Other Agents | Total | DPT | Penicillin | Other Agents | Total |
| 1– 7 | 6 | 3 | – | 9 | 2 | 1 | – | 3 |
| 8–14 | 7 | 2 | 1 | 9 | 1 | 1 | – | 2 |
| 15–21 | 5 | – | – | 6 | 2 | – | – | 2 |
| 22–28 | 7 | 1 | – | 8 | 3 | 1 | – | 4 |
| Total | 25 | 6 | 1 | 32 | 8 | 3 | – | 11 |

TABLE 6

*Ratio of Leg to Arm Paralysis in Children 5 Years of Age or Under, Inoculated with DPT or Penicillin, or Not Inoculated, New York City, 1949–1950*

| Agent Used | Interval Between Last Injection and Onset of Poliomyelitis, in Months | Number of Children Paralyzed in Limb | | | Number of Limbs Paralyzed | | |
|---|---|---|---|---|---|---|---|
| | | Arms | Legs | L/A | Arms | Legs | L/A |
| DPT | 0– 1 | 22 | 33 | 1.5 | 27 | 44 | 1.6 |
| | 1– 2 | 4 | 13 | 3.3 | 4 | 20 | 5.0 |
| | 2– 3 | 6 | 13 | 2.2 | 5 | 19 | 2.4 |
| | 1–12 | 24 | 83 | 3.5 | 29 | 111 | 3.8 |
| Penicillin | 0– 1 | 9 | 33 | 3.7 | 10 | 49 | 4.9 |
| | 1– 2 | 7 | 9 | 1.3 | 8 | 11 | 1.4 |
| | 2– 3 | 1 | 5 | 5.0 | 2 | 8 | 4.0 |
| | 1–12 | 23 | 53 | 2.3 | 28 | 69 | 2.5 |
| None | Not Inoculated | 10 | 31 | 3.1 | 12 | 42 | 3.5 |

profitable to compare the ratios of leg to arm paralysis in the two groups, whether the site of injection was known or not. It will be noted in Table 6 that among the children not inoculated, three to four times as many were paralyzed in the legs as in the arms. This held true also for children inoculated with DPT more than a year before onset and between 1 month and 1 year before onset. However, among those children injected with DPT not more than a month before onset, almost as many arms as legs were paralyzed, indicating a definite influence of the injecting agent.

In the penicillin-injected group, where all injections were given in the legs, a greater percentage of leg paralysis occurred among the children inoculated within a month than among those inoculated more than a month before onset of poliomyelitis. The difference was not statistically significant and, as already indicated, there is doubt that all the injections preceded onset of poliomyelitis.

In both the DPT and the penicillin groups the ratios of arm to leg paralysis were approximately the same, whether one compared paralyzed children or paralyzed limbs. In the group injected with other agents, the figures were too small in some categories to make comparisons worth while.

*Severity of Cases*—Studies on the severity of poliomyelitis following tonsillectomy indicate that the bulbar type is many times more frequent in cases that have had a recent tonsillectomy than in those that have had none or that had one in the more distant past.[3, 4] It was of interest to determine whether this held true also for children recently injected. In Table 7 the cases that had

received an injection of DPT or penicillin were arranged according to clinical types. Those called spinal paralytic had paralysis resulting from involvement of the spinal cord only; those called bulbar had involvement of a cranial nerve or medullary center, alone or combined with paralysis of the trunk or a limb, and accounted for almost all the deaths. For comparison, the cases that had never been inoculated were similarly arranged. It will be seen that the percentage distribution of cases inoculated with DPT within a month of onset of poliomyelitis according to nonparalytic, spinal paralytic, and bulbar types hardly differs from the percentage distribution of cases inoculated 1 month to 1 year before onset, or of those not inoculated.

Similar comparison made in children previously injected with penicillin also shows no significant difference in severity of the poliomyelitis, whether the injections had been given recently or some time in the past. An analysis made separately for children under 1 year of age, for those between 1 and 5 years, and for those in the 6 to 10 year age group also showed no significant differences in the types of clinical poliomyelitis, whatever the agent used and whatever the time interval between injection and onset of poliomyelitis.

Anderson and Skaar [25] also found no increase in bulbar cases in the recently injected group. However, they divided their spinal paralytic cases into severe and mild paralysis. They were able to demonstrate a more severe paralysis in the children immunized in the previous

TABLE 7

*Cases of Poliomyelitis According to Clinical Type and History of Previous Inoculation with DPT or Penicillin, Children 5 Years of Age or Under, New York City, 1949–1950*

| | | Interval Between Last Inoculation and Poliomyelitis, in Months | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0–1 | | 1–2 | | 2–3 | | 1–12 | | Not Inoculated | |
| Agent Used | Type of Case | No. | % | No. | % | No. | % | No. | % | No. | % |
| DPT | Nonparalytic | 7 | 12 | 5 | 23 | 2 | 9 | 20 | 15 | 7 | 16 |
| | Spinal " | 44 | 75 | 15 | 68 | 13 | 62 | 90 | 68 | 33 | 73 |
| | Bulbar " | 8 | 13 | 2 | 9 | 6 | 29 | 22 | 17 | 5 | 11 |
| | Total | 59 | 100 | 22 | 100 | 21 | 100 | 132 | 100 | 45 | 100 |
| Penicillin | Nonparalytic | 17 | 29 | 7 | 35 | 4 | 40 | 30 | 28 | | |
| | Spinal " | 37 | 64 | 13 | 65 | 5 | 50 | 62 | 57 | | |
| | Bulbar " | 4 | 7 | 0 | — | 1 | 10 | 16 | 15 | | |
| | Total | 58 | 100 | 20 | 100 | 10 | 100 | 108 | 100 | | |

TABLE 8

*Comparison of the Histories of Injections with DPT or Penicillin of Cases of Poliomyelitis, Children 10 Years of Age or Under, and in Their Matched Controls, New York City, 1950*

| Agent Used | Interval Between Last Injection and Onset of Poliomyelitis, in Months | Cases | Controls |
|---|---|---|---|
| DPT | 0– 1 | 26 (33%) | 6 (10%) |
| | 1– 2 | 8 (10%) | 10 (16%) |
| | 2– 3 | 7 ( 9%) | 5 ( 8%) |
| | 1–12 | 52 | 57 |
| Penicillin | 0– 1 | 27 (24%) | 13 (13%) |
| | 1– 2 | 7 ( 6%) | 12 (12%) |
| | 2– 3 | 9 ( 9%) | 8 ( 8%) |
| | 1–12 | 84 | 91 |

month than in those inoculated 2 to 6 months before. We did not have sufficient information on severity of paralysis to make such an analysis.

The other agents injected not more than a month before onset of poliomyelitis were too few in number to make discussion of them of value.

*Controls*—During the 1950 investigation, the physician who obtained the immunization history of the family in which a case occurred also obtained a similar immunization history from a neighboring family where no case had occurred. By matching controls to cases, as indicated earlier in this paper, one could compare the number of injections that cases and their matched controls had received recently and in the past. The distribution of the different types of immunizing agents was essentially the same in cases and in controls:

| | Cases | | Controls | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Diphtheria toxoid | 45 | 11 | 43 | 10 |
| Pertussis vaccine | 12 | 3 | 12 | 3 |
| Tetanus toxoid | 6 | 2 | 7 | 2 |
| Diphtheria toxoid and pertussis vaccine | 178 | 44 | 212 | 49 |
| Diphtheria and tetanus toxoids | 5 | 1 | 4 | 1 |
| Diphtheria and tetanus toxoids and pertussis vaccine | 159 | 39 | 147 | 35 |
| Total | 405 | 100 | 425 | 100 |

The results are shown in Table 8. It will be noted that for both DPT and penicillin a significantly larger percentage of cases than of controls had been injected within a month of onset of poliomyelitis than in the preceding 11 months. In the group injected with other agents, the numbers were too small for valid comparison. When the total group of 619 cases and a similar number of controls were compared, the results were similar (Table 9). Only in the groups injected not more than a month preceding the onset of poliomyelitis was there a significant difference between the percentages of cases and controls that had received injections, two and a half times greater in the former than in the latter.

## DISCUSSION

This investigation corroborates the published findings of other investigators that there is a relationship between recent inoculation with diphtheria toxoid, tetanus toxoid or pertussis vaccine (DPT) and the development of paralytic poliomyelitis. This is indicated by the fact that a significantly larger percentage of children was paralyzed in the injected limb when the last injection had been received not more than a month preceding onset of poliomyelitis than when received from a month to a year before. Also, where the precise site of injection was not known, but where it was known that the injection of DPT had been given in the arms, a similar difference occurred in the percentage of arm paralysis, depending on whether the inoculation prior to onset of poliomyelitis was recent or remote.

TABLE 9

*Comparison of the Histories of Injections with All Agents in Cases of Poliomyelitis, Children 10 Years of Age or Under, and in Their Matched Controls, New York City, 1950*

| | Total | | Interval Between Last Injection and Onset of Poliomyelitis, in Months | | | | | | | | | | | | At Onset or Unknown | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0–1 | | 1–2 | | 2–3 | | 1–12 | | 12+ | | Not Injected | | | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Cases | 619 | 100 | 56 | 9.0 | 19 | 3.0 | 21 | 3.4 | 163 | 26.3 | 334 | 54.0 | 14 | 2.3 | 52 | 8.4 |
| Controls | 619 | 100 | 21 | 3.4 | 25 | 4.0 | 15 | 2.4 | 173 | 27.9 | 358 | 57.8 | 18 | 2.9 | 49 | 7.9 |

Furthermore, in all inoculations with DPT, 85 per cent of which had been given in the arms, the usual ratio of leg to arm paralysis changed from about 3 to 1 to approximately 1 to 1 when the inoculation had been given not more than a month before onset. If the interval between injection and onset was greater, or if there had been no inoculation, the usual ratio prevailed.

The separation of cases that occurred in the month following the last injection of DPT, by weeks of incidence, showed some bunching of cases in the 2nd week. This suggested that the effect of the injection was felt mainly during the incubation period.

The results of injections with penicillin were not clear-cut. An analysis of the cases that followed within a month after the last injection of penicillin indicated a concentration of cases in the first few days after the injection. There is a strong probability that these injections were given therapeutically after onset but before a diagnosis was made. If these cases are omitted, even the slight differences that were occasionally noted between the effects of recent and more distant injections of penicillin lose their significance. It is pertinent to mention that in the next to last column of Table 1 there are noted 36 cases of poliomyelitis that had been injected on the day of onset. They were not used in the comparison of recent and remote injections. All but one of the injections were of penicillin. Here, too, the supposition is strong that the injections were given therapeutically, after onset.

An analysis of the histories of previous inoculations, obtained from cases of poliomyelitis in 1950 and from their matched controls, indicated that a significantly larger percentage of cases than of controls had received injections in the month preceding onset, or presumed onset, of poliomyelitis. This was true both for DPT and for penicillin. It suggests, but does not prove, that there may be an increased incidence of recognizable poliomyelitis in recently injected children. The possibility is enhanced by the fact that, as noted before in Table 1, a concentration of cases is seen in the month following the last injection. Whether this applies to penicillin- as well as to DPT-injected children depends, as previously stated, on whether injections of penicillin, given presumably before onset of poliomyelitis, had not really been given before diagnosis but after onset. Further study should elucidate this problem.

It is true that in all comparisons made, the actual numerical differences, even when statistically significant, were small. However, for DPT, the consistency of the trend and the fact that a number of other investigators found similar differences tend to strengthen the hypothesis that a definite relationship exists between recent injections and poliomyelitis. Hill and Knowelden [24] and Anderson and Skaar [25] have stressed the fact that the relationship exists only for recent injections. As in the case of tonsillectomy, there is no evidence in our investigations, either, that injections received in the more distant past have any influence whatever on the localization or occurrence of poliomyelitis. It should be noted in Tables 2, 3, 6, 8, and 9 that the differences found by a comparison of the intervals 0–1 and 1–12 months after last inoculation do not obtain when similar comparisons are made between the interval 1–2 or 2–3 months after the last injection and the rest of the year. Obviously, the influence of the last injection does not extend beyond a month following the last injection.

When the injected cases were separated according to clinical types, there was no evidence that recent injections have any influence on the bulbar type of poliomyelitis, and therefore on deaths. The percentage distribution of cases recently injected with DPT was little

different from the distribution of non-injected cases. No attempt was made to divide the spinal paralytic cases into mild and severe ones. There is some indication in the work of others[25] that recent injections tend to favor a more severe form of spinal paralysis.

The practical question that presents itself to health officers and physicians generally as a result of these and other published data is, what should their attitude be toward routine and other inoculations during the season of increased incidence of poliomyelitis? There are no published data to indicate the relative incidence of poliomyelitis in recently injected as compared with non-injected children. Korns, Albrecht, and Locke have estimated that the incidence of poliomyelitis in persons inoculated not more than 2 months before onset of poliomyelitis is about twice that of the uninoculated.[28] In New York City the median of annually reported cases of poliomyelitis is about 600, and less than 3 per cent of these occur in children under 1 year of age. In 1950, a little over 1,000 cases were reported. By actual count, 27 of these were in infants under 1 year of age and 18 of them had received an injection of some kind during the year. Ten infants had been inoculated with DPT not more than 2 months before onset.

Presumably, if no inoculations had been given to infants under 1 year of age in 1950, half of the 10 cases would have come down with poliomyelitis. The extra hazard from inoculations was therefore limited to 5 children in a year when 1,000 cases were reported. In an average year, when about 600 cases are reported, the extra hazard might involve 3 children, or 1 child in about 50,000 of that age in the population. The risk is probably even lower, since for 6 to 8 months of the year children are hardly exposed to poliomyelitis. In smaller communities the extra hazard applies to even fewer infants. It becomes obvious that although the risk to infants under a year of age from recent injections with DPT is scientifically a true one, in practice it is more academic than real. Infants under 6 months of age constitute about one-half of one per cent of all cases of poliomyelitis. The extra hazard to them is so small as to be negligible.

It appears reasonable to continue routine immunizations in infants under 6 months of age irrespective of the incidence of poliomyelitis in the community. In a nonepidemic year, routine immunizations may even be permitted in infants under 1 year of age. In older children, routine inoculations should be deferred until after the poliomyelitis season. In the presence of a severe epidemic it may be wise to defer routine inoculations among infants over 6 months of age as well as among older children. There should be no suspension of therapeutic inoculations at any time, first, because there is insufficient evidence that their effect is like that of injections with antigens; and second, because the risk of withholding them is greater than the extra risk of the injection. This holds true, also, for immediate prophylactic injections, such as booster doses of tetanus toxoid in an injured child, antirabic injections, typhoid vaccine for contacts to a case, diphtheria toxoid for nurses beginning service on a communicable disease ward, etc. In all these situations there is a greater risk in withholding the injection than in giving it.

## CONCLUSIONS

1. The inoculation histories of 1,300 children that had poliomyelitis in New York City in 1949 and 1950 were analyzed.

2. A relationship was shown to exist between site of injection and site of paralysis in children injected not more than a month before onset of poliomyelitis with diphtheria toxoid, pertussis vaccine, or tetanus toxoid, or any combination of the three.

3. This relationship was not clearly shown to follow recent injections of penicillin or other agents.

4. No increase in bulbar cases or deaths resulted from previous injections.

5. A comparison of 619 children with poliomyelitis and their matched controls indicated that a larger percentage of cases than of controls had had recent injections. This suggested that the incidence of recognizable poliomyelitis may be greater in children recently injected than in those not injected or injected in the past.

6. The extra hazard of poliomyelitis as a result of recent inoculations is small in children under 1 year of age and is negligible in infants under 6 months of age.

7. It appears reasonable to continue immunizations in infants under 6 months of age at all times. During nonepidemic years, immunizations may be given to infants under 1 year of age throughout the year. Routine immunizations may well be suspended in older children during the poliomyelitis season. In epidemic years the suspension might be extended to infants between 6 months and 1 year of age.

8. Therapeutic and immediate prophylactic injections should not be discontinued at any time.

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# The Association of Parenteral Injections with Poliomyelitis*

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THE appearance of a series of reports in the British medical literature during mid-1950,[1-5] all pointing to an association between the injection of certain vaccines and subsequent poliomyelitis, acutely disturbed health workers everywhere. The first question asked about these studies usually relates to the validity of the scientific findings; next, to how important this phenomenon is in the total poliomyelitis problem; and finally, to the damaging effect these observations might have on the well established immunization programs against several important communicable diseases. It will be recalled that all these studies showed a correlation between the site of injection and site of paralysis, limited sharply to the month before onset of poliomyelitis. Several of these investigators presented evidence to show that the severity of paralysis, at least in the inoculated limb, was greater following injections, and the suggestion was made that pertussis vaccine, either alone or in combination with other vaccines, was more frequently associated with this phenomenon than alum-precipitated diphtheria toxoid.

All except one of these studies dealt solely with poliomyelitis patients, so that an evaluation of the relative risk of acquiring poliomyelitis with or without preceding injection was not possible. Hill and Knowelden,[4] however, did compare their poliomyelitis patients with a group of matched control individuals. The sample was not large enough to settle the question but did "indicate that the group includes cases which would not have been diagnosed as poliomyelitis at all if there had been no previous and recent inoculation."

Obviously, further study of this relationship was needed and the present investigation was initiated at that time for the purpose of verifying the reports mentioned and extending the observations to include all types of injections and all age groups. In addition, an extensive control population was studied. Subsequently, the carefully documented report by Anderson and Skaar[6] appeared, confirming at all essential points the British findings and establishing the fact that the phenomenon existed in the United States and in another year, 1946, when the data upon which the report was based were collected. Although there has been considerable discussion as to the theoretical explanation and practical significance of these findings, there has appeared only one report[7] in sharp disagreement.

Another approach to the study of this association is the experimental one recently reported by Dean, Cohen, and Dalldorf.[8] Using mouse encephalomyeli-

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tis virus as the test agent given intracerebrally in mice, these investigators studied the course of subsequent paralysis in mice given different vaccines in the left front leg at varying intervals before and after the test virus was administered. Pertussis vaccine, either alone or in combination with other vaccines, yielded the most striking effects. The frequency of paralysis in the left front limb was seven times greater than expected. The mean interval between inoculation of virus and onset of paralysis was consistently shorter than in the control group given no supplementary injections. The effect was most marked when the virus and the vaccine were given simultaneously. Of especial interest in view of the findings to be reported here, the frequency of paralysis, irrespective of location, was no greater in the vaccine-treated than in the control group.

*Method of Study*

The only completely satisfactory method of evaluating the relative risk of acquiring poliomyelitis following an injection is to compare the poliomyelitis attack rate during a specified interval in a large injected population with the attack rate in a strictly comparable uninjected population of the same age, sex, geographic location, economic status, etc. Unfortunately, accurate and complete information on injections given to the population is not available in New York State. For that matter, data on diphtheria immunization, which are collected systematically by all local health departments in the state, were not found to be sufficiently complete for such an analysis, except in limited areas too small in population to furnish the necessary experience.

As a compromise, the following plan of study was developed, even though less desirable. Each case of poliomyelitis reported during the period June 1 through December 31, 1950, in upstate New York was to be visited and pertinent information obtained on a prepared form listing the age, sex, date of onset, distribution of maximum paralysis, and certain supplemental facts bearing on the diagnosis of poliomyelitis. Date of onset was considered to be the date on which the first obvious symptoms appeared, usually several days before paralysis developed. In addition, a record of all parenteral injections was obtained for the period two months prior to onset, specifying the type of material, the site, the date of injection, and whether the data had been checked with physician, school or hospital records. Exactly similar information was to be obtained by the same interviewer from each other member of the household and from the members of three additional control households located on either side and across the street from the home of the poliomyelitis patient. A two month interval was selected because according to published reports the association between injections and paralysis seemed to be strictly localized to the period one month before onset. It was therefore deemed unnecessary to extend the study backward for the collection of less reliable historical information. As will be seen later, limiting the study in this way was probably a mistake.

The informant in most instances was the mother of the household, and information was obtained on control individuals for the same two month period as used for the index case. The interviewers, except for the initial pilot study, were public health nurses or physiotherapists who were visiting the patient and family as part of the routine service program. The first 200 cases and associated controls were visited by medical students hired by the New York State Health Department during the summer period. Essentially all the visits were made within one month of the onset of poliomyelitis in the index case, and as a rule the data for a given patient, his

family, and the associated extra-household controls were obtained on the same day. Subsequently, detailed information was collected on muscle gradings performed during two periods—one to three months and six to eight months after onset. These were for the purpose of assessing more accurately the extent and severity of paralysis.

Every effort was made to avoid bias on the part of the interviewer and the informant with respect to the subject under investigation. It was for this reason that the control households were so rigidly specified, thus avoiding the possibility of deliberate or unintentional selection by the nurse. Investigators were urged to obtain the information on injections casually and indirectly during the course of inquiring about other unrelated matters. Perhaps one measurement of their success in this respect was the almost complete lack of public alarm created by the investigation. Considerable effort was made to verify the mother's statement through other sources of information.

## RESULTS

Poliomyelitis was widespread in New York State during 1950, the third largest epidemic year on record. A total of 2,982 cases was reported from the state, exclusive of New York City. The disease did not differ clinically from that seen in recent years. Thus, there were 111 deaths, a case fatality rate of 3.8 per cent. Of the reported cases, 36 per cent were classified as nonparalytic and 26 per cent were over the age of 20 years, a distribution identical with that seen in the epidemic year 1949.

A total of 2,137 cases was included in the analysis presented here, with 6,055 household controls and 14,710 control individuals from the three adjacent households. These poliomyelitis cases represent essentially a random sample of the total group of 2,870 cases reported during the study period, with the exception that the case and control populations over 40 years of age were not tabulated. This was considered to be a justifiable deletion, since only 48 poliomyelitis patients above this age were interviewed, a number too small to warrant special analysis. The remainder of reported cases not included in the study were omitted, primarily because nursing services were not available in all counties for making the necessary home visits.

### *Comparison of Injections in Patients and Control Population*

Table 1 presents the evidence collected on injections of immunizing substances in poliomyelitis patients and control individuals during the two months before onset. The material is tabulated by specific age groups and by whether the injections had been given during the first week, 8 to 31 days, or 1 to 2 months before onset. In instances where multiple injections had been received during this time period, the most recent injection was utilized for analysis. It is apparent that poliomyelitis patients gave histories of receiving immunizing injections during the two months prior to onset about twice as frequently as did the household and extra-household controls of comparable age. The number of individuals in any one age category may not be sufficient to demonstrate statistically significant differences, but the trend of the entire series is highly significant. Perhaps this is best summarized by the age-adjusted injection rates.

An unexpected observation was the persistence of this twofold difference during the second month. This disturbing finding is not in agreement with the conclusions reached by other investigators that the association between injections and poliomyelitis is restricted to the month prior to onset. Examination of the relationship by individual weeks throughout this period indicates that the twofold difference is present in

TABLE 1

*Per cent of Poliomyelitis Cases and Controls, Household and Other, Immunized, by Age and Time Before Onset, New York State (Exclusive of New York City), 1950*

| Age, Years | Number Studied | | | Time Before Onset | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Under 1 Week | | | 8–31 Days | | | 1–2 Months | | |
| | | Controls | | | Controls | | | Controls | | | Controls | |
| | Cases | Household | Other | Cases | Household | Other | Cases | Household | Other | Cases | Household | Other |
| Under 1 | 48 | 220 | 536 | 6.2 | 3.2 | 2.4 | 16.7 | 9.5 | 14.4 | 8.3 | 5.9 | 4.9 |
| 1 | 91 | 285 | 581 | 1.1 | 0.4 | 1.5 | 11.0 | 4.9 | 3.8 | 3.3 | 3.2 | 3.3 |
| 2 | 110 | 299 | 603 | 1.8 | 0.7 | 0.2 | 2.7 | 1.7 | 1.2 | 2.7 | 2.7 | 1.7 |
| 3 | 135 | 313 | 718 | 0.0 | 0.0 | 0.3 | 0.7 | 2.6 | 1.1 | 3.0 | 1.0 | 0.6 |
| 4 | 120 | 258 | 584 | 0.0 | 0.4 | 0.0 | 2.5 | 1.2 | 1.2 | 0.8 | 2.3 | 1.2 |
| 5 | 125 | 240 | 486 | 0.8 | 0.4 | 1.0 | 7.2 | 3.3 | 3.1 | 4.8 | 1.3 | 2.7 |
| 6 | 130 | 213 | 497 | 0.8 | 0.0 | 0.6 | 2.3 | 2.8 | 1.4 | 2.3 | 0.5 | 1.4 |
| 7 | 120 | 246 | 510 | 0.0 | 0.4 | 0.2 | 2.5 | 2.0 | 1.0 | 3.3 | 1.6 | 1.0 |
| 8 | 113 | 199 | 459 | 1.8 | 0.5 | 0.2 | 4.4 | 0.5 | 0.9 | 0.9 | 0.5 | 0.9 |
| 9 | 89 | 177 | 397 | 0.0 | 0.6 | 0.5 | 1.1 | 1.1 | 0.5 | 2.2 | 0.6 | 0.8 |
| 10–14 | 334 | 630 | 1,637 | 0.0 | 0.0 | 0.2 | 0.9 | 0.6 | 0.7 | 1.2 | 0.3 | 0.6 |
| 15–19 | 211 | 409 | 1,290 | 0.0 | 0.0 | 0.2 | 1.4 | 0.2 | 0.2 | 0.9 | 0.4 | 0.3 |
| 20–24 | 154 | 348 | 1,116 | 0.0 | 0.0 | 0.0 | 1.3 | 0.9 | 0.4 | 0.6 | 0.3 | 0.2 |
| 25–29 | 167 | 660 | 1,658 | 0.6 | 0.0 | 0.1 | 0.0 | 0.2 | 0.2 | 0.0 | 0.2 | 0.1 |
| 30–39 | 190 | 1,358 | 3,638 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.1 | 0.5 | 0.0 | 0.1 |
| Total | 2,137 | 6,055 | 14,710 | 0.51 | 0.30 | 0.30 | 2.53 | 1.35 | 1.21 | 1.82 | 0.91 | 0.81 |
| Age-adjusted rates | | | | 0.51 | 0.26 | 0.34 | 2.53 | 1.48 | 1.26 | 1.82 | 0.97 | 0.98 |

each of the four weeks of the second month. There is no adequate explanation for this apparent discrepancy, although supplementary information bearing on the matter is presented later under the heading, "Discussion." Unfortunately, the investigation was so designed that data were collected only for the period two months before onset; hence, study of the persistence of this difference in the antecedent period was not possible.

Figure 1 illustrates this experience graphically for the full two month period. The peak periods of immunization under 1 year and at 5 years before entry into school, and the consistent excess of injections in poliomyelitis patients at each age, stand out sharply. Detailed study of the patients under 1 year of age showed that although most of them experienced onset after reaching 6 months of age, and the injections were concentrated in this age group, the excess of injections in cases was maintained throughout the first year.

Tabulation of the types of immunizing agents used indicated that 65 per cent of the injections given during the two month period to poliomyelitis patients were recorded as combined diphtheria-pertussis-tetanus vaccine. Twelve per cent represented smallpox vaccinations and the remainder consisted largely of combined diphtheria-tetanus toxoid. The distribution of types of vaccine given to the control populations was essentially the same, with 58 per cent listed as combined diphtheria-pertussis-tetanus toxoid. The data were not extensive enough to furnish significant analyses by individual type of vaccine. The same general relationships, however, were shown by smallpox vaccination as by diphtheria-pertussis-tetanus and diphtheria-tetanus vaccine injections. This was noted both with respect to the comparison of patient and control groups and to the correlation of site of paralysis with site of injection.

Similar information for injections of penicillin is presented in Table 2 with almost identical findings, except that

Figure 1

PER CENT OF POLIOMYELITIS PATIENTS AND CONTROL INDIVIDUALS, HOUSEHOLD AND OTHER, RECEIVING IMMUNIZING INJECTIONS WITHIN TWO MONTHS PRIOR TO ONSET, BY AGE

NEW YORK STATE (EXCLUSIVE OF NEW YORK CITY) -1950

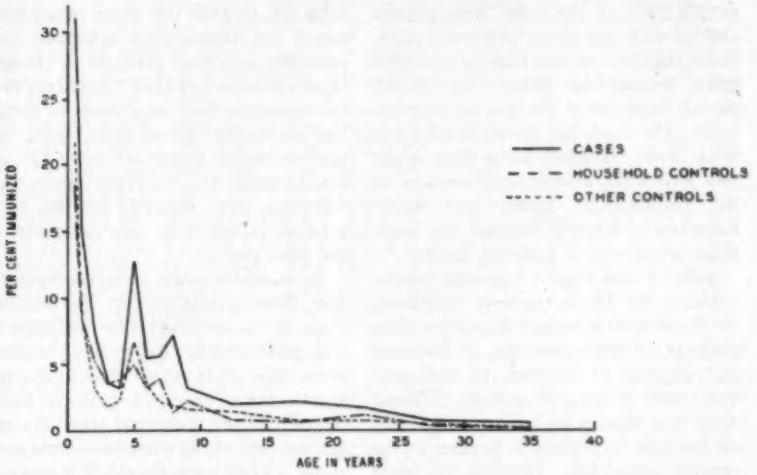



TABLE 2

*Per cent of Poliomyelitis Cases and Controls, Household and Other, Receiving Penicillin Injections, by Age and Time Before Onset, New York State (Exclusive of New York City), 1950*

| Age, Years | Number Studied: Cases | Number Studied: Controls: Household | Number Studied: Controls: Other | Time Before Onset: Under 1 Week: Cases | Under 1 Week: Controls: Household | Under 1 Week: Controls: Other | 8–31 Days: Cases | 8–31 Days: Controls: Household | 8–31 Days: Controls: Other | 1–2 Months: Cases | 1–2 Months: Controls: Household | 1–2 Months: Controls: Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Under 1 | 48 | 220 | 536 | 0.0 | 0.5 | 0.6 | 0.0 | 1.8 | 1.7 | 0.0 | 0.5 | 0.2 |
| 1 | 91 | 285 | 581 | 3.3 | 0.0 | 0.9 | 9.9 | 3.2 | 3.1 | 1.1 | 0.7 | 1.5 |
| 2 | 110 | 299 | 603 | 3.6 | 2.0 | 0.7 | 4.5 | 4.0 | 2.5 | 1.8 | 0.7 | 0.5 |
| 3 | 135 | 313 | 718 | 3.0 | 1.6 | 0.6 | 3.7 | 1.9 | 1.5 | 0.7 | 0.6 | 1.0 |
| 4 | 120 | 258 | 584 | 3.3 | 1.2 | 0.7 | 4.2 | 0.8 | 1.5 | 0.8 | 1.2 | 0.5 |
| 5 | 125 | 240 | 486 | 3.2 | 1.7 | 0.4 | 3.6 | 1.3 | 1.0 | 2.4 | 0.4 | 0.6 |
| 6 | 130 | 213 | 497 | 1.5 | 0.9 | 1.2 | 3.1 | 0.9 | 1.4 | 0.0 | 0.5 | 0.0 |
| 7 | 120 | 246 | 510 | 0.8 | 1.6 | 0.8 | 3.3 | 1.2 | 0.8 | 0.0 | 0.4 | 1.2 |
| 8 | 113 | 199 | 459 | 0.9 | 0.5 | 0.2 | 0.0 | 1.0 | 2.0 | 0.9 | 0.5 | 1.1 |
| 9 | 89 | 177 | 397 | 3.4 | 1.7 | 0.0 | 1.1 | 1.1 | 0.5 | 0.0 | 0.0 | 0.8 |
| 10–14 | 334 | 630 | 1,637 | 0.9 | 0.8 | 0.2 | 1.5 | 1.3 | 0.7 | 1.2 | 0.3 | 0.4 |
| 15–19 | 211 | 409 | 1,290 | 1.4 | 0.2 | 0.2 | 0.5 | 0.7 | 0.2 | 0.9 | 0.0 | 0.5 |
| 20–24 | 154 | 348 | 1,116 | 3.2 | 0.0 | 0.2 | 3.2 | 0.6 | 1.2 | 0.0 | 0.6 | 0.3 |
| 25–29 | 167 | 660 | 1,658 | 2.4 | 0.2 | 0.2 | 1.8 | 0.8 | 0.8 | 1.2 | 1.5 | 0.5 |
| 30–39 | 190 | 1,558 | 3,638 | 3.7 | 0.6 | 0.4 | 2.6 | 0.8 | 0.8 | 1.1 | 0.5 | 0.7 |
| Total | 2,137 | 6,055 | 14,710 | 2.29 | 0.78 | 0.41 | 2.71 | 1.32 | 1.14 | 0.94 | 0.51 | 0.61 |
| Age-adjusted rates | | | | 2.29 | 0.84 | 0.44 | 2.71 | 1.29 | 1.04 | 0.94 | 0.54 | 0.61 |

these injections were less heavily concentrated in the early years of life. The same twofold difference in the per cent of poliomyelitis patients receiving injections as compared to controls is observed during each of the three time periods and at each age level. Figure 2 illustrates the data on injections of penicillin given during the entire two month period, exclusive of the first week before onset; the injections given during this week were excluded, since they might well have been administered because of the poliomyelitis illness and would therefore arbitrarily increase the injections in patients in a biased fashion.

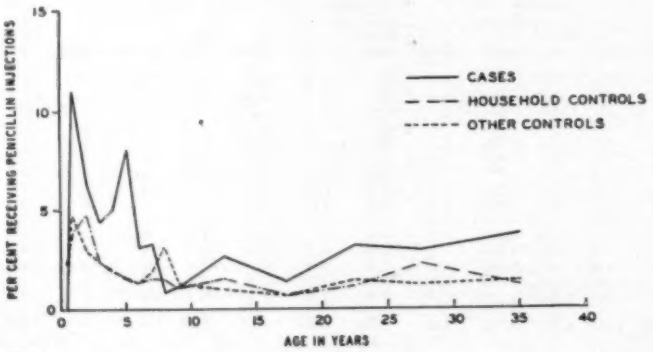
Table 3 and Figure 3 present similar evidence for other types of injections. Of the 79 such injections in poliomyelitis patients, 26 were novocain, 26 hormone and vitamin, 11 sedative, 14 venipuncture, and 2 gamma globulin. These same five categories include essentially all the injections given to persons in the control population (limited to those under 40 years). Since the latter group was considerably older than the poliomyelitis patients, injections of hormone were more common and made up 58 per cent of the total. Examination of this table shows that the same relationship noted for immunizing injections and penicillin injections exists here. It may be worth recording that 2 gamma globulin injections had been received during the two months before onset by the 929 patients under 7 years of age (0.21 per cent), while 18 (0.29 per cent) such injections were recorded for the 4,515 controls in this same age group during the same period.

By combining the material from the first three tables on an age-adjusted basis, it is seen that 12.9 per cent of the poliomyelitis cases had received some type of injection during the two months before onset, as compared to 6.1 per cent of the household associates and 6.1 per cent of the extra-household associates. Thus, even though it is assumed

Figure 2

PER CENT OF POLIOMYELITIS PATIENTS AND CONTROL INDIVIDUALS, HOUSEHOLD AND OTHER, RECEIVING PENICILLIN INJECTIONS WITHIN TWO MONTHS PRIOR TO ONSET,* BY AGE

NEW YORK STATE (EXCLUSIVE OF NEW YORK CITY) -1950




* Exclusive of first week before onset.

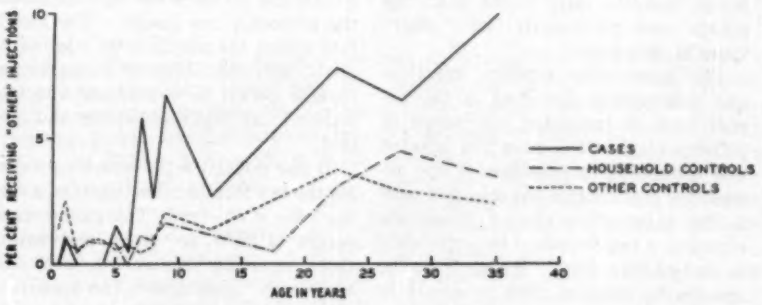
TABLE 3

*Per cent of Poliomyelitis Cases and Controls, Household and Other, Receiving "Other Injections," by Age and Time Before Onset, New York State (Exclusive of New York City), 1950*

| Age, Years | Number Studied | | | Time Before Onset | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Under 1 Week | | | 8–31 Days | | | 1–2 Months | | |
| | | Controls | | | Controls | | | Controls | | | Controls | |
| | Cases | Household | Other | Cases | Household | Other | Cases | Household | Other | Cases | Household | Other |
| Under 1 | 48 | 220 | 536 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.4 |
| 1 | 91 | 285 | 581 | 0.0 | 0.4 | 0.2 | 0.0 | 0.4 | 0.9 | 1.1 | 0.0 | 1.5 |
| 2 | 110 | 299 | 603 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.5 |
| 3 | 135 | 313 | 718 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.3 | 0.0 | 0.3 | 0.7 |
| 4 | 120 | 258 | 584 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.3 | 0.0 | 0.8 | 0.5 |
| 5 | 125 | 240 | 486 | 0.8 | 0.4 | 0.2 | 0.8 | 0.4 | 0.2 | 0.0 | 0.0 | 0.2 |
| 6 | 130 | 213 | 497 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.2 |
| 7 | 120 | 246 | 510 | 0.8 | 0.0 | 0.0 | 4.2 | 0.8 | 0.4 | 0.8 | 0.4 | 0.0 |
| 8 | 113 | 199 | 459 | 0.9 | 0.0 | 0.0 | 0.0 | 0.5 | 0.7 | 1.8 | 0.5 | 0.0 |
| 9 | 89 | 177 | 397 | 1.1 | 0.6 | 0.0 | 3.4 | 1.1 | 1.3 | 2.2 | 0.0 | 0.8 |
| 10–14 | 334 | 630 | 1,637 | 0.3 | 0.2 | 0.1 | 1.5 | 0.8 | 1.0 | 0.9 | 0.3 | 0.4 |
| 15–19 | 211 | 409 | 1,290 | 1.4 | 0.0 | 0.5 | 2.4 | 0.0 | 1.9 | 1.4 | 0.5 | 0.2 |
| 20–24 | 154 | 348 | 1,116 | 1.3 | 0.3 | 0.2 | 3.9 | 1.9 | 2.3 | 2.6 | 0.9 | 1.3 |
| 25–29 | 167 | 660 | 1,658 | 0.0 | 0.6 | 0.5 | 2.4 | 2.1 | 1.7 | 4.2 | 1.7 | 0.8 |
| 30–39 | 190 | 1,558 | 3,638 | 2.1 | 0.3 | 0.4 | 5.8 | 2.4 | 1.5 | 2.1 | 0.9 | 0.6 |
| Total | 2,137 | 6,055 | 14,710 | 0.61 | 0.25 | 0.26 | 1.92 | 1.16 | 1.21 | 1.22 | 0.61 | 0.59 |
| Age-adjusted rates | | | | 0.61 | 0.21 | 0.19 | 1.92 | 0.85 | 1.03 | 1.22 | 0.49 | 0.43 |

Figure 3

PER CENT OF POLIOMYELITIS PATIENTS AND CONTROL INDIVIDUALS, HOUSEHOLD AND OTHER, RECEIVING "OTHER" INJECTIONS WITHIN TWO MONTHS PRIOR TO ONSET, BY AGE
NEW YORK STATE (EXCLUSIVE OF NEW YORK CITY) - 1950




that an increased hazard of poliomyelitis exists following injections, this would apply at most to only 6 per cent of the reported cases of poliomyelitis. Table 4 has been added to show that the excess of injections in patients as compared to controls is still present when the analysis is limited to cases of paralytic poliomyelitis. In view of the well known variations in the sex ratio of reported poliomyelitis cases at different ages and the possibility that injection rates might

TABLE 4

*Per cent of Paralytic Poliomyelitis Cases and Controls, Household and Other, Receiving Parenteral Injections Within Two Months Prior to Onset, by Age and Type of Injection, New York State (Exclusive of New York City), 1950*

| Age, Years | Number Studied | | | Per cent Immunized | | | Per cent Receiving Penicillin Injections * | | | Per cent Receiving Other Injections | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Controls | | | Controls | | | Controls | | | Controls | |
| | Paralytic Cases | Household | Other | Paralytic Cases | Household | Other | Paralytic Cases | Household | Other | Paralytic Cases | Household | Other |
| Under 1 | 39 | 220 | 536 | 35.9 | 18.6 | 20.5 | 0.0 | 2.3 | 1.9 | 0.0 | 0.5 | 2.6 |
| 1 | 73 | 285 | 581 | 17.8 | 7.4 | 7.2 | 13.7 | 3.9 | 4.6 | 1.4 | 1.8 | 4.0 |
| 2 | 86 | 299 | 603 | 9.3 | 4.3 | 2.7 | 7.0 | 4.7 | 3.0 | 0.0 | 1.3 | 0.8 |
| 3 | 98 | 313 | 718 | 4.1 | 3.5 | 1.8 | 5.1 | 2.6 | 2.5 | 0.0 | 1.0 | 1.1 |
| 4 | 76 | 258 | 584 | 3.9 | 3.5 | 2.4 | 7.9 | 1.9 | 2.1 | 0.0 | 0.8 | 1.0 |
| 5 | 77 | 240 | 486 | 11.7 | 2.5 | 5.3 | 10.4 | 1.7 | 1.6 | 2.6 | 3.3 | 2.1 |
| 6 | 71 | 213 | 497 | 9.9 | 3.3 | 3.4 | 2.8 | 1.4 | 1.4 | 1.4 | 0.0 | 0.8 |
| 7 | 63 | 246 | 510 | 7.9 | 4.1 | 1.8 | 1.6 | 1.6 | 2.0 | 7.9 | 1.2 | 0.8 |
| 8 | 64 | 199 | 459 | 9.4 | 1.5 | 2.0 | 0.0 | 1.5 | 3.2 | 1.6 | 1.0 | 0.7 |
| 9 | 50 | 177 | 397 | 2.0 | 2.3 | 1.5 | 0.0 | 1.1 | 1.3 | 8.0 | 1.7 | 2.3 |
| 10–14 | 190 | 630 | 1,637 | 2.1 | 1.0 | 1.4 | 3.7 | 1.6 | 1.2 | 2.1 | 1.3 | 1.7 |
| 15–19 | 133 | 409 | 1,290 | 3.0 | 0.5 | 0.3 | 0.0 | 0.7 | 0.7 | 3.0 | 0.7 | 2.9 |
| 20–29 | 198 | 1,008 | 2,774 | 0.0 | 0.6 | 0.4 | 3.5 | 1.9 | 1.4 | 10.1 | 3.7 | 3.4 |
| 30–39 | 121 | 1,558 | 3,638 | 0.0 | 0.1 | 0.2 | 3.3 | 1.3 | 1.5 | 9.9 | 3.7 | 2.6 |
| Total | 1,339 | 6,055 | 14,710 | 5.8 | 2.3 | 2.1 | 4.2 | 1.8 | 1.7 | 4.0 | 2.3 | 2.3 |

* Exclusive of first week prior to onset.

vary by sex, the data in Tables 1, 2, and 3 were studied separately for males and females. No significant changes were revealed by this more refined analysis. In general, the females showed distinctly higher injection rates in the older age groups and particularly for "other" types of injections.

The relationship between injections and poliomyelitis described in this report may be translated into terms of poliomyelitis "attack rates" in injected and noninjected populations, if one accepts the premise that the injection rates in the large study control population represent a fair sample of the experience in upstate New York. By applying the age-specific injection rates by month in the study control group to the same age brackets in the upstate New York population, one may estimate the proportion of the population receiving a specific type of injection for each month under consideration.

Since similar information is available for the cases of poliomyelitis, one may estimate attack rates. This has been done in Table 5, which shows for all ages combined the attack rate in each month from July through November, for those injected within the preceding one month and for those not injected within the preceding one month. The attack rate during the month after injection is about twice that observed during a comparable period in individuals who had received no injection within this period.

If one calculates the attack rate during the two months after injection, a similar ratio is observed. This phenomenon occurs in each age group and among those receiving immunizing, penicillin, and "other" injections. The same twofold difference was observed when paralytic poliomyelitis alone was studied. Although the differences in rates between injected and noninjected populations are statistically significant, the numerical differences are small. This, of course, is a reflection of the low incidence of clinical poliomyelitis even in epidemic

TABLE 5

*Poliomyelitis Attack Rates* for Injected and Noninjected Populations, by Month of Onset and Type of Injection, Cases per 1,000 Population, New York State (Exclusive of New York City), 1950*

| Month of Onset | All Injections | Immunizations | Penicillin † | Other Injections | No Injections |
|---|---|---|---|---|---|
| July | 0.15 | 0.14 | 0.18 | 0.14 | 0.07 |
| August | 0.39 | 0.46 | 0.52 | 0.27 | 0.16 |
| September | 0.43 | 0.34 | 0.54 | 0.38 | 0.21 |
| October | 0.21 | 0.35 | 0.15 | 0.15 | 0.12 |
| November | 0.07 | 0.09 | 0.14 | 0.00 | 0.04 |

* Estimated from study for one month period.
† Exclusive of penicillin injections within one week prior to onset.

TABLE 6

*Arm Involvement in Paralytic Poliomyelitis Cases with and Without History of Injections,* by Site of Injection and Interval Between Injection and Onset, New York State (Exclusive of New York City), 1950*

| | | Site of Paralysis | | | | |
|---|---|---|---|---|---|---|
| Site of Injection | Days Before Onset | Arm Only | Arm and Other | Total with Arm Involvement | Other | Per cent with Arm Involvement |
| Arm: | 1– 7 | 1 | 1 | 2 | 8 | 20 |
| | 8–14 | 6 | 4 | 10 | 3 | 77 |
| | 15–21 | 4 | 1 | 5 | 4 | 56 |
| | 22–28 | 3 | 1 | 4 | 3 | 57 |
| | 29–42 | 2 | 2 | 4 | 11 | 27 |
| | 43–56 | 1 | 3 | 4 | 7 | 44 |
| | Total | 17 | 12 | 29 | 36 | 45 |
| Leg: | — | 5 | 15 | 20 | 71 | 22 |
| No injection | — | 113 | 276 | 389 | 787 | 34 |

* Immunizations and penicillin.

periods. The data on poliomyelitis attack rates must be accepted with distinct reservation because of certain puzzling factors in the material presented in Tables 1 through 4, upon which the estimates were based.

### *Correlation of Site of Injection with Site of Paralysis*

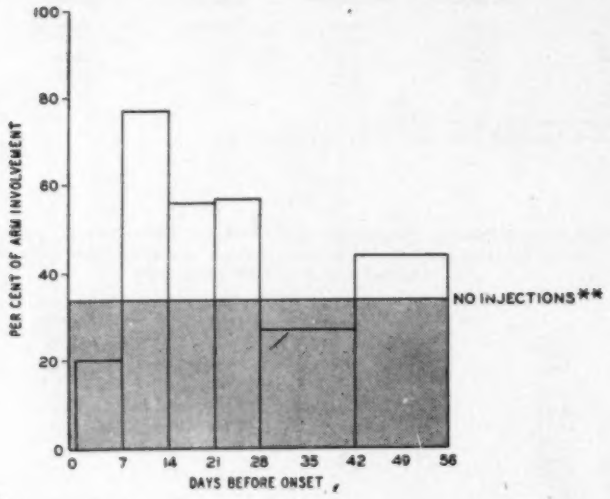
The data correlating site of injection with site of paralysis furnish perhaps the most convincing bit of evidence supporting the conclusion that there is an association between injections and poliomyelitis. This relationship has been observed by all who have studied the problem and is shown clearly in the present study for arm injections in Table 6 and Figure 4 and for leg injections in Table 7 and Figure 5. For the purpose of this analysis, immunizing and penicillin injections were combined. Actually, however, only 8 of the arm injections were penicillin and 14 of the leg injections immunizing; hence, the two tables do not present such a mixture as might be supposed.

There is a distinct excess of arm paralysis in those receiving arm injections during the period 7 to 28 days before onset. A similar but less marked excess is observed in leg paralysis following leg injections during this same period. Although not presented here because the numbers are too small to warrant illustration, the material on

Figure 4

PER CENT WITH ARM INVOLVEMENT AMONG PARALYTIC POLIOMYELITIS PATIENTS WITH ARM INJECTIONS* AND NO INJECTION BY DAYS BEFORE ONSET

NEW YORK STATE (EXCLUSIVE OF NEW YORK CITY) -1950




* Immunization and penicillin.
** This indicates per cent with arm involvement in paralytic poliomyelitis patients without prior injection.

TABLE 7

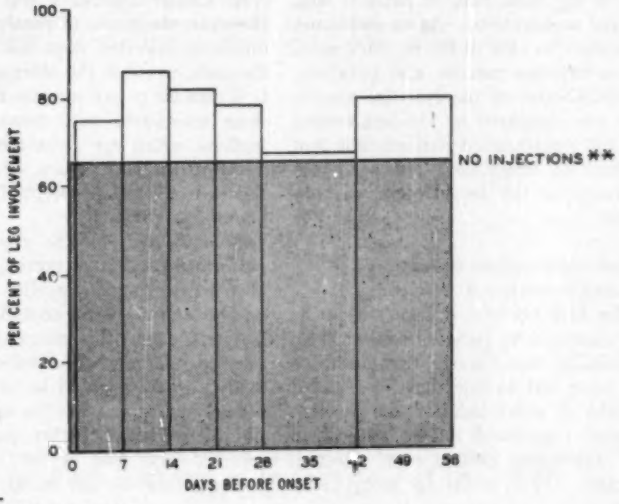
*Leg Involvement in Paralytic Poliomyelitis Cases with and Without History of Injections,* by Site of Injection, and Interval Between Injection and Onset, New York State (Exclusive of New York City), 1950*

| Site of Injection | Days Before Onset | Site of Paralysis: Leg Only | Leg and Other | Total with Leg Involvement | Other | Per cent with Leg Involvement |
|---|---|---|---|---|---|---|
| Leg: | 1– 7 | 9 | 12 | 21 | 7 | 75 |
| | 8–14 | 12 | 6 | 18 | 3 | 86 |
| | 15–21 | 6 | 3 | 9 | 2 | 82 |
| | 22–28 | 5 | 2 | 7 | 2 | 78 |
| | 29–42 | 4 | 4 | 8 | 4 | 67 |
| | 43–56 | 6 | 2 | 8 | 2 | 80 |
| | Total | 42 | 29 | 71 | 20 | 78 |
| Arm: | — | 19 | 19 | 38 | 27 | 58 |
| No injection | — | 418 | 369 | 787 | 389 | 66 |

* Immunizations and penicillin.

Figure 5

PER CENT WITH LEG INVOLVEMENT AMONG PARALYTIC POLIOMYELITIS PATIENTS WITH LEG INJECTIONS* AND NO INJECTION BY DAYS BEFORE ONSET, NEW YORK STATE (EXCLUSIVE OF NEW YORK CITY) - 1950




* Immunization and penicillin.
** This indicates per cent with leg involvement in paralytic poliomyelitis patients without prior injection.

other types of injections (most of them in the arm) demonstrates the same distribution. Thirteen, or 57 per cent, of 23 patients receiving such injections in the arm developed arm paralysis compared to only 219, or 39 per cent, of the 344 patients of comparable age who were not injected. In view of observed variations in the ratio of arm to leg paralysis at different ages, the data presented in Tables 6 and 7 were analyzed by specific age groups. This showed that the excess of paralysis in injected limbs was manifest in each age group studied.

Poliomyelitis following novocain injections deserves special comment. There was a total of 26 cases of poliomyelitis with history of such injections during the two months before onset, 19 of which were for dental work. Of this latter group, 4 had bulbar disease, 11 had other types of paralysis, and 4 were nonparalytic. Three of the bulbar cases were associated with injections during the period 8 to 14 days before onset and the fourth with an injection 2 days before onset. This is in sharp contrast to the observation that only 2 non-bulbar paralytic and one nonparalytic case were associated with injections during this two week period. One cannot, of course, exclude the possibility that the factor involved in this excessive amount of bulbar poliomyelitis was actually the dental extraction or other dental manipulation rather than the injection of novocain (extraction was performed in all except one instance).

Concerning the association between

paralysis of a specific limb and the site of injection, Table 8 furnishes further detail, again confirming previous observations. In each instance, paralysis is more frequent in the injected limb than in the same limb of patients who received no injections. As an additional precaution, in view of the reported association between exercise and paralysis, the distribution of paralysis by specific limb was compared in 136 left-handed and 303 right-handed patients who had received no injections. No significant difference in the two groups was observed.

### *Severity of Paralysis in Injected and Noninjected*

The first bit of evidence suggesting that paralysis in patients following an injection is more severe than in those who have had no injection is presented in Table 9, which indicates the per cent of cases considered to be paralytic in each age group and in each injection category. Thus, in the age group under 1 year, 93.3 per cent of the cases occurring after immunizing injection were paralytic, as compared to 78.1 per cent of the group without injection. Similarly in the next age group, 1 to 4 years, an even greater difference was observed. However, the excess of paralytic disease following injection does not persist to the same extent in the older age groups. It is difficult to say whether this implies some association with immunizing injections, which are given almost exclusively in the early years, or whether it relates to a special susceptibility of this young age group.

As indicated, muscle gradings were performed on a large portion of the reported cases of poliomyelitis. Detailed reports were available on 1,004 of these. To some extent this group represents a selected sample of the total cases in the study, being weighted in favor of the severely paralyzed, but the selection had no reference to whether patients had received injections or not. Table 10 presents cases by age group, severity of

TABLE 8

*Site of Paralysis in Poliomyelitis Cases, by Specific Site of Injection* and Interval Between Injection and Onset, New York State (Exclusive of New York City), 1950*

| Site of Injection | Interval, Injection to Onset, in Days | Cases with Paralysis in Limb Injected | Cases with Paralysis in Other Sites Only | Per cent with Involvement of Injected Limb: By Interval | Per cent with Involvement of Injected Limb: Total | Per cent of Noninjected Cases with Involvement of Same Limb |
|---|---|---|---|---|---|---|
| Left arm: | 1–7 | 0 | 5 | 0 | 41 | 20 |
| | 8–28 | 9 | 6 | 60 | | |
| | 29–56 | 4 | 8 | 33 | | |
| Right arm: | 1–7 | 2 | 2 | 50 | 56 | 14 |
| | 8–28 | 5 | 3 | 62 | | |
| | 29–56 | 2 | 2 | 50 | | |
| Left leg: | 1–7 | 4 | 3 | 58 | 50 | 48 |
| | 8–28 | 3 | 4 | 43 | | |
| | 29–56 | 3 | 3 | 50 | | |
| Right leg: | 1–7 | 2 | 1 | 67 | 67 | 43 |
| | 8–28 | 2 | 0 | 100 | | |
| | 29–56 | 2 | 2 | 50 | | |
| Both legs: | 1–7 | 6 | 3 | 67 | 76 | 66 |
| | 8–28 | 19 | 4 | 83 | | |
| | 29–56 | 6 | 3 | 67 | | |

* Immunizations and penicillin.

TABLE 9

*Paralytic and Nonparalytic Cases of Poliomyelitis, According to Injection History, and Age, New York State (Exclusive of New York City), 1950*

| Age, Years | Diagnosis | Total | Number of Cases Receiving | | | | Per cent Paralytics Among Cases Receiving | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Immunizations | Penicillin | Other Injections | No Injections | Immunizations | Penicillin | Other Injections | No Injections |
| Under 1 | Paralytic | 39 | 14 | 0 | 0 | 23 | 93.3 | — | — | 76.1 |
| | Nonparalytic | 8 | 1 | 0 | 0 | 7 | | | | |
| 1– 4 | Paralytic | 333 | 28 | 27 | 1 | 277 | 93.3 | 93.1 | — | 75.7 |
| | Nonparalytic | 103 | 2 | 2 | 0 | 99 | | | | |
| 5– 9 | Paralytic | 325 | 28 | 11 | 13 | 273 | 71.8 | 55.0 | 72.2 | 56.4 |
| | Nonparalytic | 236 | 11 | 9 | 5 | 211 | | | | |
| 10–19 | Paralytic | 323 | 8 | 7 | 8 | 300 | 66.7 | 70.0 | 61.5 | 61.3 |
| | Nonparalytic | 201 | 4 | 3 | 5 | 189 | | | | |
| 20–29 | Paralytic | 198 | 0 | 7 | 20 | 171 | — | 70.0 | 87.0 | 64.2 |
| | Nonparalytic | 102 | 3 | 3 | 3 | 93 | | | | |
| 30–39 | Paralytic | 121 | 0 | 4 | 12 | 105 | — | 57.1 | 63.2 | 70.0 |
| | Nonparalytic | 56 | 1 | 3 | 7 | 45 | | | | |
| Total | Paralytic | 1,339 | 78 | 56 | 54 | 1,151 | 78.0 | 73.7 | 73.0 | 64.1 |
| | Nonparalytic | 706 | 22 | 20 | 20 | 644 | | | | |

TABLE 10

*Severity of Paralysis in Poliomyelitis Patients with and Without History of Injections* During the Two Months Before Onset, by Age Group, New York State (Exclusive of New York City), 1950*

| Age, Years | History of Injections | Number | | | | | Per cent Distribution | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Severe | Moderate | Mild | Light-None | Severe | Moderate | Mild | Light-None | Total |
| Under 5 | No injections | 152 | 33 | 33 | 31 | 50 | 22 | 25 | 20 | 33 | 100 |
| | Injections | 35 | 9 | 9 | 12 | 5 | 26 | 26 | 34 | 14 | 100 |
| 5– 9 | No injections | 254 | 25 | 56 | 75 | 98 | 10 | 22 | 29 | 39 | 100 |
| | Injections | 29 | 4 | 5 | 6 | 14 | 14 | 17 | 21 | 48 | 100 |
| 10–19 | No injections | 259 | 27 | 38 | 79 | 115 | 10 | 15 | 31 | 44 | 100 |
| | Injections | 19 | 4 | 6 | 2 | 7 | 21 | 32 | 10 | 37 | 100 |
| 20–29 | No injections | 134 | 36 | 38 | 30 | 30 | 27 | 28 | 22 | 22 | 100 |
| | Injections | 28 | 4 | 10 | 6 | 8 | 14 | 36 | 21 | 29 | 100 |
| 30–39 | No injections | 86 | 20 | 26 | 15 | 25 | 23 | 30 | 17 | 29 | 100 |
| | Injections | 8 | 2 | 1 | 3 | 2 | 25 | 13 | 37 | 25 | 100 |
| Total | No injections | 885 | 141 | 196 | 230 | 318 | 16 | 22 | 26 | 36 | 100 |
| | Injections | 119 | 23 | 31 | 29 | 36 | 19 | 26 | 24 | 30 | 100 |

* Includes all types of injections.

involvement (based on gradings one to three months after onset), and whether injections had been given during the two months prior to onset. The results are not striking or completely consistent, but there is some trend toward greater severity of paralysis following injection. The extent of paralysis as determined by muscle gradings was summarized for each patient in a numerical fashion, utilizing a technique described elsewhere.[9]

DISCUSSION

Every reported investigation of the association between injections and poliomyelitis has demonstrated a definite positive correlation between site of paralysis and site of injection, an observation which is clearly confirmed by the present study. If this were the only factor involved, neither the medical profession nor the public would be unduly disturbed. The association might be compared to that existing between tonsillectomy and poliomyelitis, except that in the latter the increased hazard of bulbar poliomyelitis furnishes cogent reasons for concern. Certain details are missing in this study which would have served to define the relationship more accurately—for example, the exact types of materials injected (whether fluid or alum-precipitated vaccine, soluble or repository penicillin); route of injection (intracutaneous, subcutaneous, or intramuscular); and the sequence in the pattern of developing paralysis following injections. Unfortunately, the limitations of the study method made it impossible to obtain refined information along these lines.

The problem of major concern to health workers and to the public at large relates to whether the hazard of acquiring paralytic poliomyelitis is actually increased by injections given during a period when exposure to the virus is likely. The data presented in this study would tend to indicate that this hazard is doubled during the two months following an injection of immunizing material, penicillin, or a variety of other materials. The validity of this conclusion is challenged by the observation that the data also show an increased risk extending through the second month before onset. This is not in keeping with preconceived ideas on the subject, nor does it fit the recorded facts on the incubation period of poliomyelitis.

Naturally, the question has arisen, whether the interviewers or the informants were prone to obtain more complete information on injections in poliomyelitis patients than in the control population. Great efforts were made during the course of the study to avoid this source of bias. It would certainly seem likely that such a discrete and definite entity as a parenteral injection given during the two month period immediately preceding onset of the poliomyelitis would be engraved upon the memory of the mother equally well for all members of her family. One factor in the analysis seems to support this contention; namely, the close similarity at each age level in the per cent receiving various types of injections, among the household controls, as compared to the extra-household controls. If the mother of the poliomyelitis patient recalled more completely the injections given to the patient, it would seem that she might in turn recall injections among her other children more completely than did the mothers in adjacent households where poliomyelitis was not present.

One technique for evaluating this possibility of bias would have been to include on the investigation form miscellaneous unrelated questions concerning each household member, which, if bias existed, should have shown the same twofold difference between cases and controls. Unfortunately, such questions were not included. The only method readily available for verifying the reliability of these data was to cross-check the study cases and control individuals from certain areas against the immunization record files in health departments. In only two counties of the state, Erie and Westchester, were these records sufficiently complete to warrant this type of evaluation.

The results of this cross-checking (limited to patients and control individuals under 15 years of age) are presented in Table 11. It can be seen that, based on information obtained in the study survey, 7.2 per cent of the 180

TABLE 11

*Immunizing Injections Given During Two Months Before Onset to Poliomyelitis Patients and Controls,* As Determined by Study and Health Department Records, Erie and Westchester Counties, 1950*

| Groups | Total in Study | Immunization Within 2 Months | | | |
|---|---|---|---|---|---|
| | | Number | | Per cent | |
| | | Study Record | Health Department Record | Study Record | Health Department Record |
| Patients | 180 | 13 | 4 | 7.2 | 2.2 |
| Controls | 809 | 38 | 13 | 4.7 | 1.6 |
| Total | 989 | 51 | 17 | 5.1 | 1.7 |

* Limited to patients and controls under 15 years of age.

patients had received an immunizing injection within the two months before onset, as compared to 4.7 per cent of the 809 control individuals, a ratio of 1.5 to 1. Through search of the health department files, with records entirely independent of this study, it was established that 2.2 per cent of the patients had received immunizing injections during the two months before onset, as compared to 1.6 per cent of the controls, an almost identical ratio of 1.4 to 1. These numbers are too small to provide a statistically significant answer to this question but they at least tend to confirm the validity of the comparison between patients and control individuals.

It is worth noting that in reviewing the immunization records on file in health departments for the 989 individuals studied, only 3 instances were uncovered where health department files recorded an immunization which had not been discovered through the study survey.

Even though one accepts the statement that the risk of acquiring poliomyelitis during the two months after an injection is doubled, this does not necessarily prove that the increased risk is caused by the injection. It has been suggested that attendance at an immunization clinic or a visit to the doctor's office, with attendant exposure to infection, might be the deciding factor instead of the injection itself. It must be admitted that all injections of penicillin were probably given because of some febrile illness. Thus, it is impossible to say whether the injection, *per se*, or the underlying illness was the factor involved in precipitating poliomyelitis.[10]

All these suggestions, however, tend to be refuted by the observation that the site of injection is correlated with the site of paralysis, an association that could hardly be explained by any of these factors. The data presented here do not help much in understanding the mechanism involved in this phenomenon. One cannot say whether this relates to the introduction of virus at the site of injection or to some nonspecific "trigger" mechanism furnished by the injected material which precipitates poliomyelitis illness or paralysis in a person already infected. Although the numbers of cases are small, it may be worth recording that in this study the median interval between immunizing injections in the arm and paralysis was 23 days, while for injections in the leg it was 30 days. No consistent difference in pattern was observed in different age groups.

Although the final evaluation of the hazard involved was not complete, the New York State Health Department felt it necessary to take some administrative action in June, 1951. It was recommended to all physicians in the

state that elective injections be avoided during the poliomyelitis season, except in infants under six months of age, at which age the danger of poliomyelitis is insignificant and the bulk of routine immunizations should be performed. It recommended further that if poliomyelitis became epidemic in a given area, these injections be discontinued in infants as well.

The medical profession and public were much disturbed by the issuance of these recommendations, since they were misread to imply that all types of injections be discontinued. Obviously, it was not intended that important therapeutic and prophylactic injections be interrupted because of the relatively small hazard of poliomyelitis. Even though one accepts the evidence pointing to a doubling of the poliomyelitis attack rate during the month following an injection, one could be accused merely of doubling the weight of a feather. Perhaps a better way of stating the situation would be to indicate that, based on data in Table 5, the likelihood of escaping poliomyelitis during the month following an injection was in September, the peak month, 999.6 per 1,000 injected individuals. This compares with the rate of 999.8 per 1,000 noninjected persons. Nevertheless, the increased hazard, though small, seemed sufficiently significant to warrant the recommendations issued.

A striking reduction in the quantity of diphtheria-pertussis-tetanus vaccine distributed by the State Health Department occurred immediately after this announcement. During the remaining portion of the poliomyelitis season, this reduction persisted but did not differ particularly from the customary summer decline in distribution noted consistently during the past decade.

## SUMMARY

1. A study of the association between injections and poliomyelitis was conducted through the collection of data on injections from a group of 2,137 poliomyelitis patients, 6,055 members of the patients' households, and 14,710 other control individuals from adjacent households.

2. The per cent of patients with a history of immunizing injections, penicillin injections, or a miscellaneous group of other injections during the two months before onset was twice that seen during the same period in the control population of similar age.

3. The excess of injections among patients as compared to controls was present throughout the two month period.

4. A positive correlation between the site of paralysis and site of injection was demonstrated.

5. Paralysis in patients tended to be slightly more severe following injection than in those who had had no injections.

6. The study confirms the previous reports of an association between injections and poliomyelitis. The exact hazard in terms of increased risk of poliomyelitis after injections should be defined more accurately, and further evaluation of the practical importance of this phenomenon in public health practice is needed. However, the postponement of *elective* injections in areas where poliomyelitis is epidemic or during the poliomyelitis season in certain age groups seems justified for the time being, until these matters have been settled.

ACKNOWLEDGMENT—The authors wish to thank the many health officers, public health nurses, physiotherapists, and medical students who participated in the collection of the basic data, for the conscientious efforts they put into the study. Special thanks are due Wendell Ames, M.D., M.P.H., Deputy Commissioner of the Erie County Health Department, and William A. Holla, M.D., Commissioner of the Westchester County Health Department, for assistance in searching their files for immunization records of persons from these counties in the study population.

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# Commission To Survey Health Needs

President Truman by executive order has created a 15 member Commission to study the nation's total health requirements. This Commission on Health Needs of the Nation has the responsibility of recommending within a year ways for meeting the health needs in both the immediate and distant future.

In announcing the Commission, the President declared that the present world crisis made it particularly important that "we should seek to limit the drain upon our strength through illness and death. . . . Many vital problems remain unanswered, such as insuring an adequate supply of physicians, dentists, nurses and allied personnel; developing local public health units throughout the nation; making more hospitals and hospital beds available where needed; stepping up the tempo of fundamental medical research; meeting the needs of the chronically ill and aged; and providing adequate diagnostic, rehabilitative, and other services to all income groups."

Paul B. Magnuson, M.D., former medical director of the Veterans Administration, has been appointed chairman of the Commission. He is the author of a proposed national health program based largely on local diagnostic clinics charging what the patient could afford. Under his plan treatment would be by private physicians, and losses incurred by the clinics met by contributions from federal, state, and local governments and private organizations. The other members of the Commission, as announced, of whom 4 are Fellows of the American Public Health Association, and representing a wide variety of consumer interests as well as medicine and medical education, are:

Dean A. Clark, M.D., general director, Massachusetts General Hospital, Boston
Joseph C. Hinsey, Ph.D., dean, Cornell University Medical College, New York City
Gunnar Gundersen, M.D.,* a trustee of the American Medical Association, La Crosse, Wis.
Russel V. Lee, M.D., associate clinical professor of medicine, Stanford University School of Medicine, San Francisco
Evarts A. Graham, M.D., surgeon, St. Louis
Marion W. Sheahan, R.N., director, National Committee for the Improvement of Nursing Services, New York City
Ernest G. Sloman, D.D.S., president-elect, American Association of Dental Schools, San Francisco
Walter P. Reuther, president, United Automobile Workers, C. I. O., Detroit
A. J. Hayes, president, International Association of Machinists, Washington
Clarence Poe, president and editor, *The Progressive Farmer*, Raleigh
Charles S. Johnson, president, Fisk University, Nashville
Lowell J. Reed, Ph.D., vice-president, Johns Hopkins University and Hospital, Baltimore
Chester I. Barnard, president, Rockefeller Foundation, New York City
Elizabeth S. Magee, general secretary, National Consumers League, Cleveland

* It is reported that Dr. Gundersen has withdrawn from the Commission.

# Public Health Aspects of the Campaign Against Yellow Fever in Central America

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SOME time just prior to November, 1948, sylvan yellow fever which is now known to have been present in subendemic form in Eastern Panama since 1929, three years before the discovery of its existence as an entity in scientific knowledge, crossed the Bayano River as a wave progressing westward through the Republic of Panama. Arrival of the epidemic phase of the wave in the Province of Bocas del Toro in Western Panama was indicated by the death on April 15, 1951, in the Almirante Hospital of the Chiriqui Land Company, of René Ramírez, a Costa Rican chainman who had been working on a road survey in the forest near Almirante. René Ramírez was the seventh human fatality to be diagnosed as due to yellow fever in Panama from December, 1948, to April, 1951.

When this fatality occurred, the Director of Public Health of the Republic of Costa Rica was notified that the wave of sylvan yellow fever was about to cross the boundary from Panama into Costa Rica, and the Office of the Central American Sector, Pan American Sanitary Bureau, was also so notified. Early in June, 1951, a farmer was admitted as a patient to Almirante Hospital from the Costa Rican side of the boundary in the vicinity of Nievecita, Panama, from whom the virus of yellow fever was isolated by the Department of Virology of Gorgas Memorial Laboratory before he recovered from the disease.

An intensive vaccination campaign in the Province of Limón, Costa Rica, beginning in the Talamanca and Estrella Districts was initiated on April 24, 1951, by the Director of Public Health of Costa Rica, with the assistance of the Pan American Sanitary Bureau and the Institute of Inter-American Affairs. Both the Dakar (mouse brain) and the embryonated 17-D vaccines were used. This campaign extended northward to include all the area south of the general line Puerto Limón-Siquirres-Gúapiles, and was then further extended north and west into the Provinces of Heredia and Alajuela.

The critical area in Costa Rica was considered to consist of that part of the Province of Limón south of the Puerto Limón-Gúapiles line, and since the velocity of the wave in Panama had been estimated at about 11 miles per month, the epidemic was not expected to attain this line until some time in September. However, an epidemiologic survey had been planned for the vicinity of Puerto Limón, sponsored by the Scientific Committee of the Medical Association of the Isthmian Canal Zone, to arrive in Costa Rica in August for the purpose of locating the crest of the wave as accurately as possible, since its movement in the Republic of Panama had been traced only by the westward sequence of human fatalities proved by histologic diagnosis of the liver lesion at autopsy. Unfortunately no funds were available for accurate tracing of the progress of the wave by other reliable means in the Republic of Panama, nor were funds

available for the survey in the vicinity of Puerto Limón planned for the month of August.

During the period of the latter half of July to the latter half of September, sylvan yellow fever developed with explosive violence in four epidemic centers in Costa Rica, generally along the line Puerto Limón - Siquirres - Güapiles - Río Cuarto-Pital-Altamira, in the Provinces of Alajuela, Heredia, and Northern Limón, and vaccination in these regions was greatly intensified. It is to be pointed out that no proved fatalities from the disease occurred south of this line. The velocity of the wave appeared to have accelerated in an unexpected burst.

It is now believed that the outbreak of the epidemic in Costa Rica before the anticipated time was not attributable to an acceleration of its velocity but to a miscalculation in tracing its pathway in its manner of crossing the Panama Canal. There were three epidemic foci incident to this crossing of the Canal: (a) The initial outbreak in the Pacora District east of the Canal on the Pacific Side (November–December, 1948); (b) the Buena Vista District east of the Canal between the Middle Chagres River and the Gatun River in the Gatun watershed (August–September, 1949); and (c) the Chagres District west of the Canal Zone on the Atlantic watershed north of the southwest extension of Gatun Lake (January, 1950). It was not until the occurrence of the fatality in the Chagres District that it was realized that a wave was in progress and that the disease was not already widely disseminated. Shortly after this event Almirante was alerted to watch for the arrival of the wave in Western Panama as it migrated westward through the Atlantic rain forest. Its arrival at Almirante was then estimated about September, 1951.

The occurrence of the Almirante fatality in April, 1951, upset the timetable and confused the estimates. Basing the velocity then on the apparent speed of the wave from the Chagres District to Almirante, a revision of the timetable placed the crest in the vicinity of Puerto Limón about September, 1951. This was again wrong, for it arrived at that point some six weeks earlier than expected.

The source of all these miscalculations was then sought, and it is now believed that a reasonable explanation can be found in the manner in which the wave crossed the Panama Canal. It had been assumed that the movement of the wave followed the shortest geographical forested pathway, which is undoubtedly not a sound assumption after a study of the terrain and circumstances prevailing in the vicinity of the Canal, for there is an epidemiological gap along the Middle Chagres River. The villages in this region never reported dead monkeys, nor did they have any cases of yellow fever. It is true they had been visited by vaccinating teams, but so had the population of the Buena Vista area just a few miles north of them, and there were subsequently three proved human fatalities in the Buena Vista farming region between the Trans-Isthmian Highway and the Canal Zone Boundary. It was also assumed — evidently erroneously — that from the Buena Vista area the wave, after crossing the Canal by way of Barro Colorado Island, jumped directly across the lake over some five kilometers of open water to the Chagres District, which would still be within the flight range of Haemagogus mosquitoes.

Taking cognizance of these factors, it now seems likely that the route was actually as follows: Pacora District—across the continental divide (very low just east of Canal Zone)—forest east of Madden Lake—forest north of Madden Lake—forest west of Madden Lake down into the Buena Vista District—Barro Colorado Island—forest west of the Canal and south of western extension of Gatun Lake—Atlantic rain

forest to Almirante. If this be the true course of the wave, then the fatality in the Chagres District west of the Canal Zone was the result of a "back lash" of the wave sweeping northeast to the region north of the western extension of Gatun Lake, while the true front of the wave was already well to the west in the Atlantic rain forest on its way to Western Panama on the Atlantic Side of the continental divide. This correction appears to restore the validity of a time-table, and an estimate of velocity at from 12 to 15 miles monthly can still be substantiated. It has taken approximately three years already for the wave to advance from the Bayano River in Eastern Panama to the San Juan River on the Nicaraguan border.

In Costa Rica the circumstances were ideally conducive to the acquisition of a wealth of epidemiologic and clinical information relative to yellow fever by contemporary techniques. San José has been the nerve center of the campaign, for which it is exceptionally well situated both geographically and in respect to the already existing organization of the Costa Rican Public Health Service. The natural drift of casualties from all the affected areas was toward San José, and the sensitive network of the Public Health Service operated with amazing efficiency, since all sanitary inspectors in rural areas are required to make routine daily telegraphic reports to the Director of Public Health.

Yellow fever, when it occurs in a wholly nonimmune population and is not prevented by timely vaccination, is usually so dramatic in its onset when it develops in its severe form that the stricken person is aware of the exact moment when he becomes ill, and seeks immediate hospitalization. In this form it is truly the "coup de barre." Milder forms will also occur down to the "inapparents," who merely develop immunity without manifest illness. For this reason it is believed that most of the severe cases in Costa Rica eventually reached San Juan de Dios Hospital in San José, where extensive clinical studies were conducted by the staff and all fatal cases were autopsied.

It is fortunate indeed that sylvan yellow fever has been so effectively analyzed and studied during its passage through Costa Rica in all aspects— epidemiologically, clinically, pathologically, and in its clinical pathology. It will now be possible to deal with it even more effectively in its anticipated progress through Eastern Nicaragua, Northern Honduras, Guatemala (Provinces of Izabal and Peten), Yucatan, and Mexico. This is the first time in modern history that a wave of sylvan yellow fever in its pure form has occurred in Central America under such circumstances that it will probably remain free from the complicating aspects of the urban component, since the *Aëdes aegypti* mosquito has been all but eradicated from this part of the hemisphere.

### ROLE OF THE HELICOPTER IN CONTROL OF SYLVAN YELLOW FEVER

At the request of the Director of Public Health of the Republic of Costa Rica, a United States Air Force "Rescue" type helicopter was obtained by Chargé d'Affaires Philip P. Williams of the United States Embassy in Costa Rica, through the State Department, to assist in vaccinating the rural population in areas difficult to reach. This helicopter, piloted by an officer of long experience in such work in Panama, returned to the Canal Zone on September 26, 1951, after 13 days of participation in the campaign, and after having contributed with decisive effect to what appears to have been the final effort that coincided with the decline of the epidemic.

The people of Costa Rica were deeply appreciative of this sincere gesture of cooperation, and many lives were saved by it. As pointed out by the Director

of Public Health of Costa Rica it was not a question of how many it could help to vaccinate, but rather that of reaching those few who felt themselves hopelessly isolated by impassable trails and rain-swollen streams as the epidemic closed in upon them. Not once were any of the farmers frightened by the helicopter, but many times they gathered spontaneously in their own selected spots and lighted signal fires to attract it with its pilot, Capt. John R. Peacock, and its passenger, Costa Rican Dr. Honorio Arias to unscheduled landings.

Due to weather conditions over the fogbound forested plain of Northern Costa Rica, the helicopter could operate only between 8:00 and 11:30 in the morning, but in spite of this the following results were attained:

Total landings—42
Landings for notification only, or for inquiry about dead monkeys—23
Vaccinations—978
Hours of flight—26
Medical consultations in addition to vaccinations—200

An outstanding precedent was established by the use of this helicopter in establishing a proof of fellowship in human relations, and as stated by the Costa Rican Minister of Health, Dr. José Cabezas D., in presenting the men with medals, "This is the most effective kind of inter-American coöperation. The project has accomplished more than I dared hope."

## SIGNIFICANCE OF THE EPIZOÖTIC PHASE OF SYLVAN YELLOW FEVER

Legends of Caribbean people from Trinidad to Guatemala, and possibly even in Mexico, where the bloody vomit (Xekik) was known in pre-Columbian times, relate that the approach of (sylvan) yellow fever has on many occasions been heralded by the wholesale deaths of monkeys in the forests. In Panama it has recently been demonstrated by Dr. N. E. Collias and Charles Southwick that the howler monkeys of Barro Colorado Island, a wildlife preserve in Gatun Lake, were decimated by some epizoötic shortly after the dry season of 1949, at approximately the time when the yellow fever epidemic was known to be active 9 miles northeast of the island in the Buena Vista area.

Dead monkeys were again reported in the Changuinola River Basin, west of Almirante, late in January, 1951, just two and a half months before the death of René Ramírez at the Almirante Hospital on April 15.

In an area as well organized as Costa Rica, the reports on the progress of the epizoötic were highly reliable. It appears to be the spearhead of the wave. At times it may be manifest simultaneously with the epidemic, as in densely populated rural areas, or at other times it may spurt far ahead through uninhabited forest and jungle.

## MECHANISM OF WAVE ACTION OF SYLVAN YELLOW FEVER

Experience both in Panama and so far in Costa Rica leads to the assumption that the epidemic phase of this yellow fever wave tends to involve localities which, as in Costa Rica, may comprise a fairly wide front, and that the time-depth of the epidemic phase may be up to two months. The following data support this concept:

| *Locality* | *Date of First Fatality* | *Date of Last Fatality* |
|---|---|---|
| Pacora District, R. P. | November 12, 1948 | December 30, 1948 |
| Buena Vista District, R. P. | August 7, 1949 | September 9, 1949 |
| Four epidemic centers in Costa Rica | July 24, 1951 | September 20, 1951 |

It will be of interest to note whether or not this phenomenon repeats itself in Nicaragua as population centers of adequate density are involved in the progress of the wave.

Why these waves originate from seemingly stabilized enzoötic centers is not wholly understood, but since they are expansive, there remains only one direction in which such a wave can move in Central America, canalized by two oceans. It must migrate north and west from country to country, following forest continuity, canopy mosquitoes, and the arboreal mammals until it terminates in Mexico, probably remaining on the Atlantic side of the continental divide.

It is most unlikely that it will double back, since it leaves in its wake no persistent virus reservoir, because only the dead, the immune, and those few individuals who escaped being bitten by infected canopy mosquitoes, whether man, tree-dwelling primate, or other arboreal mammal, appear to be left behind it. It is like a grass fire, to which the nonimmune mammal of the forest is its fuel, and the nonimmune victim and temporary reservoir of the virus lies only in its grip or in advance of its front, as the treetop mosquitoes fan out within their flight range. It is also significant that the life span of *Haemagogus spegazzinii falco Kumm*, one of the principal vectors, is reported to be about 65 days, and that there is no hereditary transmission of the virus.

Panama has not experienced a single human fatality behind the epidemic phase of the wave after it has cleared a given region, and it is believed that this experience will be repeated in Costa Rica. This observation cannot be attributed to vaccination, for experience has already decisively demonstrated that mass vaccination of large population groups in rural areas is not that good. From the point of view of epidemiologic experience, Panama could be considered today as free from sylvan yellow fever as it was prior to the outbreak of the disease in the Pacora District. Recognition of this condition will greatly facilitate the economic problems of the Central American countries as they are in turn involved and cleared by the epidemic.

In the meanwhile it seems that Central America west and north of the San Juan River on the border between Nicaragua and Costa Rica will in due time be undergoing the experiences of Panama and Costa Rica. Unpredictable and unexpected events may occur in those countries. The wave may not follow the pattern it has manifested so far. Not only will those countries need assistance from the Pan American Sanitary Bureau and the Institute of Inter-American Affairs, but they can well use help from any source. Greater scientific efforts should be made to study the broad aspects of the epidemiology of the epizoötic and epidemic phases of sylvan yellow fever, for there are still four to five years to come during its progress northward and westward through Central America to Mexico that will afford the opportunity for this to be done. The opportunity for research is without parallel in the history of medical science, and the need for aid for the farmers of the rural areas is urgent.

Above all, it will be important to maintain accurate contact with the wave as it progresses through "silent" areas of low population density, or regions where its "silence" may be due to climatic conditions or other factors as yet so poorly understood but so much in need of investigation.

The critical months for epidemics so far have been January, April, August, and September on the Atlantic (Caribbean) side in Panama, and July to September in Costa Rica.

# Further Studies of a New Serologic Test in Tuberculosis*

EDGAR R. MAILLARD, M.D.

*Director, Division of Laboratories and Research, Nassau County Department of Health, Hempstead, N. Y.*

IN a previous report,[1] a new serologic test for tuberculosis was described. The reagents and procedures were standardized so as to yield results which would be quantitative and reproducible. A reaction which was characterized by hemolysis in the test results from fixation of complement by an antigen-antibody system. The specific complex was formed at the cell surface, and in the presence of complement the blood cells became lysed in a manner similar to that which occurs by specific hemolysin. The binding of specific antibody and of complement to the surfaces of the blood cells was determined by preliminary coating of the cell surface with antigen (Old Tuberculin).† The titer of the tuberculous antiserum was recorded as the highest dilution causing a constant degree of hemolysis (50 per cent) with a constant dose of complement (four units). Thus, the degree of hemolysis obtained with the highest dilution of reacting serum provides a direct index of the titer of the serum.

## TECHNIQUE OF THE TEST

The specimens were examined by a preliminary test which consisted of 0.1 ml. of the patient's serum; four 50 per cent units of complement contained in 0.1 ml.; 0.2 ml. of 2.5 per cent suspension of antigen (tuberculin-treated sheep cells); and 0.1 ml. of physiological saline. The total volume was always 0.5 ml. The following controls were included: a known reacting tuberculous serum and a nonreacting serum; a control for anticomplementary property of the patient's serum consisting of 0.1 ml. of the patient's serum, one unit of complement contained in 0.1 ml., 0.1 ml. of appropriate dilution of antisheep amboceptor, 0.1 ml. of 2.5 per cent suspension of sheep cells, and 0.1 ml. of physiological saline. The tests were allowed to stand for one hour at 3° to 6° C. They were shaken to resuspend the cells, placed in a water bath at 37° C. for 30 minutes, and shaken at one minute intervals. The results were read by comparing the various degrees of hemolysis in the tests to a color standard representing degrees of hemolysis from 0 to 95 per cent, at intervals of 5 per cent. Any serum with which no hemolysis was noted was considered to be nonreacting, and no further tests were done. Those specimens which gave evidence of reaction were tested further with smaller amounts of sera in order to determine the titer. (See Tables 1 and 2.)

## SERA TESTED FROM TUBERCULOUS AND NONTUBERCULOUS DONORS

Sera from 136 patients with clinical and laboratory evidence of tuberculosis were tested. The specimens were collected from January, 1951, and were

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-ninth Annual Meeting in San Francisco, Calif., October 30, 1951.

† Concentrated tuberculin (4x international standard, Lot No. 2725-19A) was kindly supplied by Henry D. Pierama, Ph.D., Director, Human Biological Section, Lederle Laboratories, Pearl River, N. Y.

TABLE 1

*Technique of Preliminary Test*

| *Reagent* | *Amount* |
|---|---|
| Patient's serum | 0.1 ml. |
| Physiological saline | 0.1 ml. |
| Antigen (tuberculin-treated sheep cells) | 0.2 ml. |
| Complement—four units | 0.1 ml. |
| Total | 0.5 ml. |

obtained from patients admitted to the Nassau County Sanatorium for Tuberculosis. No reactions were obtained with specimens from 10. The remaining 126 reacted with titers from 1 to 225 (Table 3).

Sera were tested from 173 apparently normal persons; 125 were prenatal women and 48 employees, all of whom were x-rayed and showed no evidence of any infiltrative disease of the lungs. No reactions were obtained from any of these specimens.

Sera from 157 patients with miscellaneous diseases were tested. Sera from 9 patients gave a titer of 1, sera from 2 patients gave a titer of 2, sera from 1 gave a titer of 3, sera from 1 gave a titer of 5, and a titer of 10 was obtained with another.

Titers of 5 and 10 were obtained with sera from patients with clinical and laboratory evidence of Hodgkin's disease. As far as it was possible to determine, no evidence of tuberculosis could be found in any of these patients.

### LEPROSY

Since sera from leprosy patients have been known to react with other serologic tests for tuberculosis, it seemed of interest to apply this test to the study of sera from such patients.

Sera from 23 of the 24 patients with clinical manifestations of lepromatous, tuberculoid, and mixed types of leprosy reacted in the test. In one that failed to react, the disease was stated to have been arrested. All of these patients were reported not to have clinical or x-ray evidence of pulmonary tuberculosis.

### STUDY OF A SERIES OF SPECIMENS

Serial specimens of sera collected at intervals of one or more months from all the patients admitted to the sanatorium since January, 1951, were studied serologically. In practically every instance there was noted a rise in titer of the sera collected within the first few months as compared to the first specimen collected upon admission. Although the period of observation is as yet insufficient for a complete evaluation of the serologic study, preliminary trends indicate that, with a continued study of serial specimens, a serologic pattern may evolve which might be helpful in determining activity or arrest of the tuberculous process.

The results of the serologic study of sera collected at intervals from 3 patients with pulmonary tuberculosis are presented:

#### CASE I

O.E.: Age 37, white, male.

*Admitted:* January 19, 1951, with hemoptysis, cough, and expectoration. History of long-standing tuberculosis with remissions. X-ray showed lesions to be bilateral and far advanced.

*Treatment:* Bed rest; para-aminosalicylic acid, 12 gm. daily for 3 months—a total of 1,068 gm.; streptomycin, 1 gm. twice weekly for two weeks (4 gm.).

*Course:* Lesions which were active upon admission have continued to become worse with extension of the process on the right side (see Figure 1.)

#### CASE II

G.F.: Age 35, black, male.

*Admitted:* October 20, 1950, with fatigue, loss of weight, cough and expectoration, and pain in right chest. History of onset, August, 1950. X-ray examination showed far-advanced disease of only the right lung.

*Treatment:* Bed rest; para-aminosalicylic acid, 12 gm. daily for a total of 3,054 gm. Similarly, streptomycin, 1 gm. twice weekly for a total of 114 gm.

*Course:* In April, 1951, x-ray evidence of tuberculosis of the left lung. X-ray examina-

TABLE 2

*Technique for Test with Reacting Serum*

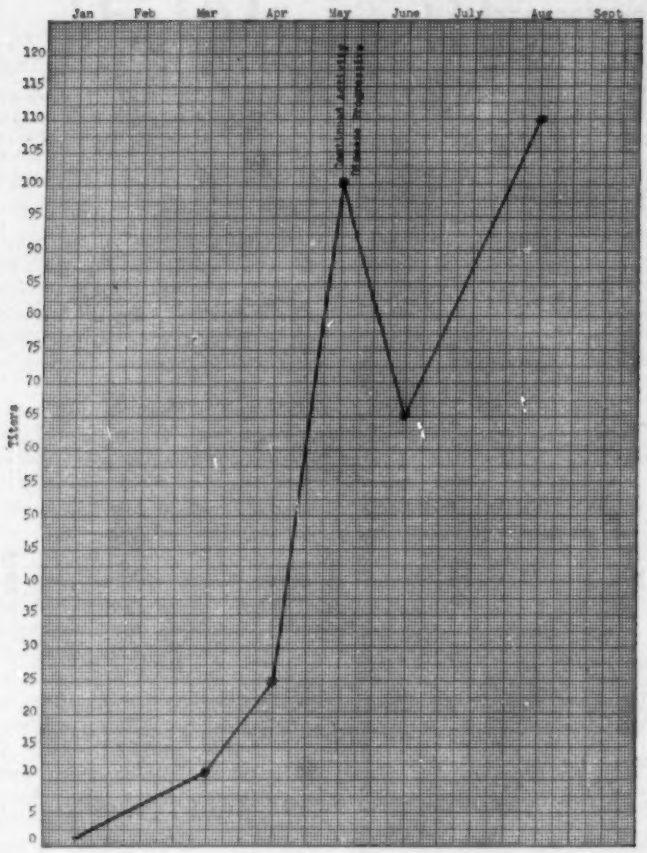
| *Tube* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|
| Patient's serum: | | | | | | | | | | |
| Dilution used | Undiluted | Undiluted | Undiluted | Undiluted | 1:4 | 1:10 | 1:10 | 1:10 | 1:10 | 1:10 |
| Amount pipetted, ml. | 0.1 | 0.05 | 0.03 | 0.02 | 0.06 | 0.1 | 0.08 | 0.06 | 0.04 | 0.03 |
| Final dilution represented | — | 1:2 | 1:3.3 | 1:5 | 1:6.6 | 1:10 | 1:12.5 | 1:16.6 | 1:25 | 1:33.3 |
| Physiological saline, ml. | 0.1 | 0.15 | 0.17 | 0.18 | 0.14 | 0.1 | 0.12 | 0.14 | 0.16 | 0.17 |
| Antigen (tuberculin-treated sheep cells) ml. | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Complement—four units—ml. | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |

TABLE 3

*Comparison of Titers from Tuberculous and Nontuberculous Donors*

| | | *Titers* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Donors* | *No Reaction* | *1* | *2* | *3* | *4* | *5–10* | *11–15* | *20–30* | *35–45* | *50–75* | *100–150* | *225* | *Totals* |
| Tuberculous | 10 | 7 | 9 | 8 | 4 | 35 | 21 | 12 | 8 | 13 | 7 | 2 | 136 |
| Nontuberculous: | | | | | | | | | | | | | |
| Leprosy | 1 | 1 | | 1 | 8 | 5 | 1 | 4 | 1 | 1 | | | 24 |
| Prenatal | 125 | | | | | | | | | | | | 125 |
| Employees | 48 | | | | | | | | | | | | 48 |
| Syphilis | 31 | 3 | 1 | | | | | | | | | | 35 |
| Cancer | 12 | 2 | | | | | | | | | | | 14 |
| Coronary disease | 4 | 2 | 1 | | | | | | | | | | 7 |
| Bronchopneumonia | 6 | | | | | | | | | | | | 6 |
| Coccidioidomycosis | 1 | | | | | | | | | | | | 1 |
| Miscellaneous diseases | 73 | | | | | | | | | | | | 73 |
| Hodgkin's disease | 16 | 2 | | 1 | | 2 | | | | | | | 21 |

Figure 1




tion July, 1951, showed clearing of the lesions of both lungs (see Figure 2.)

CASE III

R.C.: Age 37, white, female.

*Admitted:* March 7, 1951, with cough, expectoration, slight loss of weight, and left chest pain. X-ray showed minimal involvement of right lung, with moderately advanced lesions of the left lung.

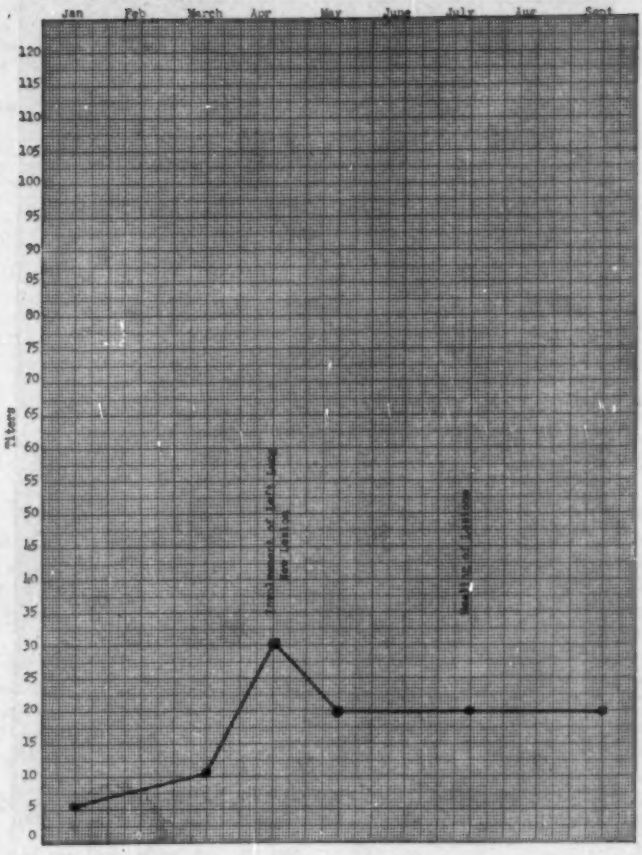
*Treatment:* Bed rest, para-aminosalicylic acid, 12 gm. daily for a total of 2,500 gm. Pneumoperitoneum since April 27, 1951.

*Course:* X-rays taken at intervals of 6 weeks to 2 months show continued clearing of both lungs (see Figure 3.)

ANTIGEN STUDIES

Since sera from approximately 7 per cent of patients with clinical and laboratory evidence of tuberculosis failed to react with the routine antigen, which is tuberculin-treated sheep cells, it seemed important to determine whether cells treated with specific fractions of the tubercle bacillus would prove to be a more sensitive antigen. Sheep cells treated with optimal dilutions of a polysaccharide fraction of the tubercle bacillus were tested with sera which had

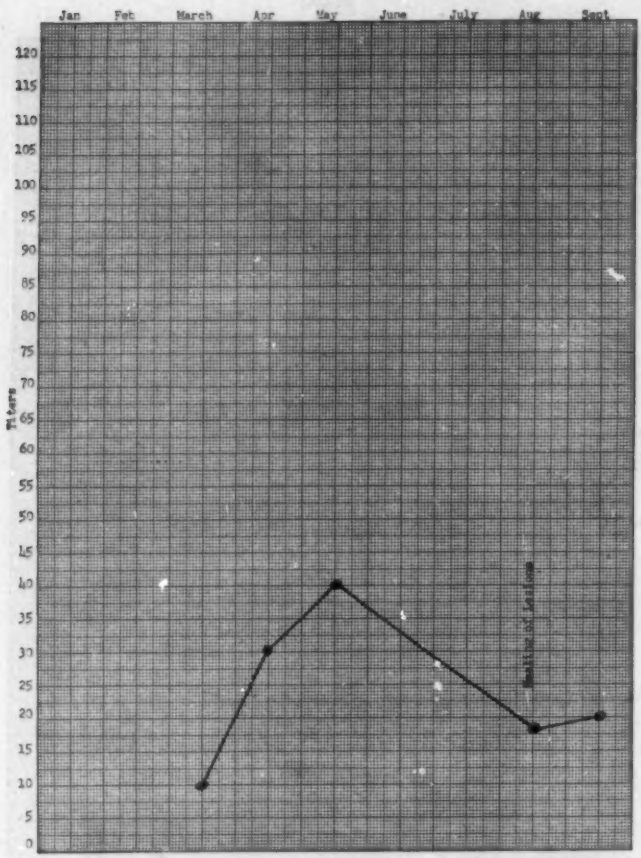
Figure 2




failed to react, as well as sera which had reacted with the routine antigen. The nonreacting sera still failed to react with the polysaccharide-treated cells, while the reacting sera gave titers similar to those obtained with the routine antigen. These findings would suggest that the routine antigen is mainly polysaccharide which has been adsorbed on the surface of the sheep cells treated with Old Tuberculin.

This observation confirms the report of a number of investigators,[2, 3] in that the polysaccharide component of the bacteria is usually adsorbed on normal erythrocytes. This has not, however, been found to be true of the protein fraction. Boyden[4] has reported that adsorption of purified protein preparations on erythrocytes may be effected by previously treating cells with inulin or tannic acid. Sheep cells previously exposed to either inulin, tannic acid, or trypsin were treated with Old Tuber-

Figure 3




culin. The cells similarly exposed to either one of the three different substances and treated with Old Tuberculin were tested with sera from tuberculous patients which had failed to react and had reacted with the routine tuberculin-treated antigen. The results were similar to those obtained with the tuberculin-treated and polysaccharide-treated sheep cells.

Although the Old Tuberculin could not be considered as purified protein material, it was anticipated that some of the proteins may also be adsorbed on the surface of the preliminary treated sheep cells in addition to the polysaccharide, giving the antigen a wider valence.

## SUMMARY

It has been possible to detect by this test tuberculous antibodies in the sera of approximately 93 per cent of tuberculous patients.

Preliminary studies indicate that, with continued studies of serial specimens, a serologic pattern may evolve which will be helpful in

determining activity or arrest of the tuberculous process.

Studies made possible through the standardization of the technical procedures have indicated the antigen to be mainly polysaccharide, adsorbed on the surface of Old Tuberculin-treated sheep cells.

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# International Federation of Public Health and Preventive Medicine

The Provisional Committee of the International Federation of Public Health and Preventive Medicine held a meeting in Paris at the Pasteur Institute on October 22, 1951, with Professor J. Parisot, the honorary president, in the chair. Representatives were there from Belgium, Denmark, Finland, France, Germany, Great Britain, Italy, Netherlands, Norway, Switzerland, the United States, and the World Health Organization.

A tribute was paid to the memory of Dr. G. H. de Paula Souza, one of the founders of the Federation, and its first president, the director of the Faculty of Public Health at Sao Paulo, Brazil, who died in May 1951.

In addition to national groups which joined the Federation at the 1950 meeting, it was indicated that the Norwegian Public Health Association, the Italian Society for Hygiene, and probably the Danish Association of Public Health will enter the Federation, as well as the Federation of the French Association of Hygienists and Municipal Technicians.

Dr. Rene Sand of Belgium, secretary general, was directed to pursue negotiations, looking toward a joint meeting of the Federation with the American Public Health Association in Cleveland, Ohio, the week of October 20, 1952.

Officers for the coming year include:

*President:* Prof. Dr. J. H. Tuntler, Groningen, The Netherlands
*Vice-President:* Reginald M. Atwater, M.D., New York
*Secretary-General and Treasurer:* Rene Sand, M.D., Brussels, Belgium

# Food Plant Sanitation*

PAUL E. LAUGHLIN

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GENERAL sanitation problems involved in any food industry are fundamentally the same. They are concerned with housekeeping, pest control, microörganism control, waste disposal, and many other contributing factors. These general phases of sanitation vary only in the degree of their importance as related to plants and products. The specific problems in different food industries are varied and complex. There is little similarity in the intimate detail of plant sanitation requirements and practices in canneries, bakeries, confectionary plants, cereal mills, and dried fruit establishments. The one common problem is the necessity for maintaining cleanliness, so that maximum protection of the end product is accomplished on the most economical basis available.

The mere employment of a sanitarian or the maintenance of a sanitation staff will not by itself insure the wholesomeness of the pack or immunity from law enforcement. John L. Harvey,[1] Associate Commissioner, Federal Food and Drug Administration, in one of his talks said: "Assuredly the Food and Drug Administration has no interest in who maintains a plant in proper condition free from filth so long as it is so maintained." Since it is the primary duty of any food industry sanitarian to keep his employer's product above reproach, both from the consumer and from the regulatory agency viewpoint, it is imperative that a food plant sanitation program be actually and positively productive of the desired results and not just a spectacular effort.

In organizing an effective sanitation program many important considerations must be observed. For example, a sanitation director must consider the type of activity or the scope of a proposed program. The large corporation with many plants, the trade association comprising one or more segments of an entire industry, and the one plant firm will undoubtedly require separate considerations in organizing their sanitation programs. Other factors which will affect the organization and functioning of a sanitation program are:

1. How much financial backing is available for travel, equipment, assistants, etc.?
2. Are employers concerned only with avoiding law enforcement, or have they an honest interest in preparing a clean food product for their consumers?
3. How many firms or plants or both are involved? Are there many scattered, or a few localized in one area?
4. Are there any personality conflicts with immediate employers, other sanitarians, or plant managers?
5. What are the activities and attitude of law enforcement agencies?
6. Is top management back of the program 100 per cent and is the sanitation director an integral part of top management?

In studying these questions we find that our sanitation program will shape itself in accordance with the circumstances under which we must operate. It is apparent that any food industry sanitation program must function within the economic limits afforded by that particular industry or plant. A program

* Presented before the National Association of Sanitarians and the Engineering Section of the American Public Health Association at the Seventy-ninth Annual Meeting in San Francisco, Calif., November 1, 1951.

cannot be geared so that the maintenance of such a program will result in financial loss to the firm or industry.

To be practical, we must know our business. We must have knowledge and understanding of the operating, handling, and processing techniques in our industry. To be of any real assistance to a food industry, a sanitarian must be familiar with the handling procedures in order to be able to recognize the sanitary problems. When he knows what the sanitary problems are he must proceed to solve them, utilizing ingenuity along with good common sense and scientific knowledge. It is not always possible to solve a problem immediately and in the way that is theoretically correct. One cannot say "tear it down and build a new one," or "your handling procedures are all wrong, you will have to find another way!" If the sanitarian is unable to provide another way within reasonable limits, he may have to improvise to solve the immediate problem. I do not mean to imply that better ways in which to handle and process food are not necessary. New methods are finding their places every day, but some things may have to wait until the proposed change has proved its worth or until funds are available.

All food concerns are interested in avoiding confiscation of their product which will result in bad publicity and great financial loss. How much further some concerns are interested is another problem. They may merely wish to meet the minimum food law requirements as currently enforced, or they may have a sincere desire to produce a clean product and provide immaculate plant conditions. Those who are interested in a sanitary end product over and above the laws and tolerances have become more and more aware of the importance of over-all plant sanitation in controlling potential sources of contamination. They have been shown that an efficient sanitation program can actually eliminate many potential sources of contamination.

The Dried Fruit Association is a trade association made up of a large percentage of the packers of dried fruits, e.g., prunes, figs, pears, apricots, peaches, apples, and raisins. The members include large and small firms. Some operate comparatively small plants handling local production of one variety, whereas others pack the full line in several plants located in areas of principal production. Some of our members employ trained sanitarians, and others have chemists, food technologists, or quality control men who are responsible for the sanitation within their respective plants. We work closely with these men where our activities concern their plants. Our work covers the packing end of an entire industry which, at times, gives us an opportunity to be of assistance to a sanitarian whose work may be confined to one phase of the industry.

The dried fruit industry has become more and more conscious of the importance of sanitation in the handling of foodstuffs. The industry, realizing the need for a continuous program, has made plant sanitation a major project. The sanitation department employs two trained sanitarians, a director and an assistant. Since I came to the dried fruit industry without any special knowledge about it, I have spent considerable time becoming acquainted with the operating procedures and observing the unique and specific sanitation problems with which the industry has to contend. Our program in the dried fruit industry is designed to incorporate any and all phases of sanitation which may be implicated in the receiving, processing, storing, and packaging of dried fruit for human consumption.

The routine aspect of our program consists of regular rounds of plant inspections, including all of our members' properties and plants. These inspec-

tions are unannounced and include an over-all check of all phases of sanitary practice. In warehouses, the inspection involves principally a check of general housekeeping and pest conditions. In packing plants the inspection must include a number of other considerations from personnel behavior to physical conditions of the plant. There is no set routine and there is no check list for reporting these inspections. Factual notes are made of any sanitary deficiency and the superintendent is informed of all findings. Recommendations are made for the correction of any deficiencies. A narrative report is submitted to owners and principals of the firms involved, with extra copies for superintendents. A copy of each report goes into the association's file for ready reference in checking plant conditions in regard to improvement, or backsliding, as compared to previous inspections. Our aim is, first, to take care of the fundamental changes which are obviously direct food contaminating hazards. Once these changes have been accomplished we are able to consider conditions which indirectly contribute to possible food contamination and various other desirable but less important sanitary features. In other words, we do not make a practice of complicating our reports with the so-called superficial niceties until we have solved the primary sanitation problems at hand.

This inspection and reporting routine involves frequent personal contact by the sanitarian with the plant, the management of the plant, and the owners. At all times we encourage members to submit any sanitary problems which we miss. Where we ourselves do not always have the answers at our finger tips, we usually do know where the answer may be found. We have had very helpful assistance from the University of California, Food Technology Division, the Dried Fruit Insect Laboratory of the U. S. Department of Agriculture, and from our own Dried Fruit Association Technical Department.

The only yardstick of the success of our program is believed to be the actual results noted in the various plants. This trend is measured by our so-called Comparative Sanitation Report. This report is based on the narrative type reports that are submitted following each complete round of plant inspections. Three phases of sanitation are separately covered, one evaluating the Physical Condition, one the Operational Condition, and one for the Pest Conditions. All grades are arbitrarily assigned and each plant is graded in comparison to what is considered the most satisfactory over-all sanitary conditions noted during any one round of plant inspections. For the purpose of this report, and to assure a clear understanding of what we mean in assigning grades, we have defined such collective terms as "Housekeeping," which means various different things to different people. Housekeeping, in so far as our inspection and reporting procedures are concerned is defined to include: (1) Storage conditions, (2) Orderliness, (3) Janitor service—nothing more. We refer to other phases of sanitation under appropriate headings, i.e., "Machinery and Equipment," "Personnel," and "Physical Plant Conditions," and so forth. Two of these comparative reports are made, one dealing with packing plants and the other dealing with warehouses. A complete report of the grading of all plants is distributed to all participating firms.

In order to maintain as much uniformity as possible, with two of us independently making plant inspections, we periodically follow one another in inspecting various plants (a double inspection) and then compare notes to find out if we have noted the same conditions. This has proved very effective in maintaining uniformity in reporting as well as keeping both of us on our toes in making inspections.

Our relationship with all firms and plants is confidential. The condition and rating of plants is revealed only to owners and responsible employees of the firms involved. To preserve this confidence, code symbols are used to identify plants in our Comparative Sanitation Reports.

Not only is there an indication of industry trend from one Comparative Sanitation Report to another, but also there is aroused a competitive spirit between firms and between plants within a firm. Each tries to merit a grade better than the others and to improve his position in the industry listing. This actually is occurring and in many cases the Comparative Report probably serves a more useful purpose in the promotion of interest than any other single feature of our program. It is possible, in almost every instance, to correlate individual grades with the reasons for improvement or retrograde in the position of plants on this Comparative Report.

Upon request, we make special visits to aid in any way that the member firm wishes, in addition to routine plant inspections to all member plants. For example this may include special instruction in the fundamentals of food plant rodent control to employees responsible for rodent control within their respective plants. Occasionally, in response to a request, we have personally directed a demonstration of a particular phase of sanitation in an individual plant. Other special services include participation in individual plant meetings or company meetings. Such meetings give us an opportunity to discuss sanitation problems informally with foremen, foreladies, and other supervising personnel.

Our program also includes regular sanitation meetings held annually in different locations near the centers of dried fruit plant locations. These meetings are held in the off season of the year. Owners, superintendents, sanitarians, foremen, and other personnel specifically responsible for sanitation are invited to these meetings. Attendance is on a voluntary basis and the meeting involves an afternoon starting with lunch. We have tried to make these meetings interesting and informative by encouraging participation by those in attendance. One sanitation subject is chosen for each meeting, e.g., Receiving and Storage, Machinery (clean-up, construction and design), Personnel Behavior, and so forth. Subject matter for these district meetings is usually chosen on the basis of its current importance and is decided upon by the Dried Fruit Association Sanitation Committee. Formal addresses, films, slides, and round-table discussions have all been exploited. Each year we strive to improve on past meetings. Our recent district meetings have emphasized a discussion period preceded by visual aids in the form of slides from our own film library. Aside from the main purpose of selling specific sanitation features to plant men, these meetings bring together individuals from competing firms and afford them an opportunity to talk over common problems.

The Dried Fruit Association has organized two sanitation committees, Northern District and Fresno District, which are appointed each year at the Dried Fruit Association Annual Meeting. These committees are made up of men from representative member firms. Regular committee meetings are held monthly in the off season and every other month during the busy season. Current sanitation problems are discussed at these meetings. In general these committees help guide the over-all course of our program.

Another very valuable meeting is the Dried Fruit Association Annual Meeting. Since the industry is concentrated in the northern interior valleys of California, it is possible to hold a general

meeting each year, and practically all owners and principals attend. Time has always been allotted at these meetings for a report from the Sanitation Department. The business sessions are closed meetings in which the speakers can unbend freely with their problems, bring out the crying towel, irritate or compliment the members, or in other ways attempt to influence the guiding policies in the group toward a better understanding of the needs of the program. This one meeting, even with the short time allowed for sanitation reports, gives us a real opportunity to advise those who are the policy makers in our industry concerning the progress and needs of their sanitation program.

Each month we publish a sanitation newsletter aimed primarily to contact those responsible for sanitation in the plants. This newsletter is mailed to all owners, superintendents, foremen, and other key personnel. Material includes any new developments in sanitation, answers to specific questions, new materials and equipment of sanitary significance, abstracts from current literature, and articles by various plant men. We include virtually anything which we feel will be of value from a sanitation viewpoint to our industry.

We participate in some research from time to time in coöperation with our Technical Department. The Dried Fruit Association Technical Department maintains a laboratory and staff of highly skilled technicians in Fresno, Calif. Whenever the solution of a sanitation problem requires technical research, this department and its facilities are available for our use.

Our photo library, which we are building continuously, consists of slides and prints of the sanitary features in dried fruit plants. At present we have approximately 500 slides in color and black and white. Many of these slides would be difficult, if not impossible, to duplicate because of the numerous changes that have taken place since the collection was started. This photo library serves as a main source of visual aid material used for our various meetings. We feel that this collection of photographs is especially valuable because all pictures pertain specifically to our industry and its problems. We are not forced to look to other sources for visual demonstration material which oftentimes is not pertinent.

We hold membership in several professional organizations such as the Association of Food Industry Sanitarians, Institute of Food Technologists, American Association of Economic Entomologists, and the National Association of Sanitarians. Since our time is limited, we cannot be active in all these organizations but much is gained from the journals as well as any meetings or conferences which we are able to attend.

We have recently worked out a guide for self-inspection programs in the individual plants, large, medium, and small. The purpose of this guide is to assist each and every member plant, and especially those not employing sanitarians, in setting up a program which will enable them to find their sanitation problems and in turn promptly correct them without outside assistance. The program guide includes a procedure set up for the plant depending on its organizational size, a check list on what to look for and how to inspect, and a reporting form. As we make plant inspections, we encourage the employment of self-inspection programs and offer assistance in setting up such programs for each plant.

Our association sanitation program is primarily educational. The human element, so vital and yet so difficult to control, is probably our program's most serious concern. We must deal with individuals who have varying concepts of sanitation. Some have a very high sensibility to hygienic decency, while others may not see the necessity for

practising some sanitary measures. This problem becomes very acute when you are dealing with people who have not learned about modern personal hygiene and have little desire to accept the high standards of sanitation expected of them. The problem of changing people's pattern of living as expressed in terms of successful plant operation over a period of years calls for exceptional salesmanship. In our case it is selling sanitation, and every effort is made to develop a consciousness on the part of the firm and the worker which will result in desirable sanitary practice. In accomplishing these ends we always tell the person or persons concerned the specific reasons for sanitary measures. Without overlooking building and design, our program stresses "Operation."

The desire in our industry, and with our program, is for results and not just that an effort be made. Our entire approach to plant sanitation is from a preventive viewpoint. Law enforcement agencies see the situation differently since their work is based on food laws, and correction by legal action is their ace-in-the-hole. This, of course, means that evidence which will stand up in court must be obtained and, consequently, many Food and Drug Inspectors make their inspections to search primarily for such evidence. Many times conditions are overlooked which should be corrected but which are not actionable under the laws.

In order to perform a complete service we must consider the word "insanitary" in its broadest sense. We cannot be and are not concerned only with health hazards, in fact most of our work evolves around the esthetic things. Section 402 (a)(4) of the Federal Food and Drug and Cosmetic Act says, "A food shall be deemed to be adulterated if it has been prepared, packed, or held under insanitary conditions whereby it may have become contaminated with filth, or whereby it may have been rendered injurious to health." The "May" clause, as this law is commonly known, points up the first and most important function of a food plant sanitation program and that is to control contamination of the pack. We also must be concerned with employee appearance, behavior, and welfare, especially as they pertain to possible food contamination. We are always mindful of the regulations related to employee health such as proper type drinking fountains, lighting, and ventilation.

An example of the superficial and what we consider to be secondary in a plant sanitation program is pointed out by John Harvey of the Federal Food and Drug Administration, who said: "I have seen manufacturers spend thousands of dollars in improving their premises by the use of glass, brick, and tile to make fancy and appealing front offices and exclude the fundamental changes which might be much less expensive but which would render their plants truly fit as a place for food manufacture."[1]

As we look forward to further modernization and progress in our industry, we are not forgetting the old saying that "Rome was not built in a day." This calls for considerable patience along with much hard work. In looking back on our accomplishments we can see definite progress and we know that our program has been worth while, otherwise it would not have been sustained and expanded. At the same time we are never satisfied and are continually striving to make changes which will be of greater value to our employers as indicated by ever better plant conditions.

REFERENCE

1. Food Plant Sanitation, John L. Harvey, Chief of Western District Federal Food and Drug Administration, given at a joint meeting of the Northern California Pest Control Association and Pest Control Operators of California, San Jose, Calif., July 27, 1946.

# Proposed Report on Educational Qualifications of Public Health Dentists*

This is a provisional report published at the request of the Committee on Professional Education of the American Public Health Association before transmittal to the Governing Council in order to permit the members and Fellows of the Association to review it and to offer criticism and suggestions. All comments will be carefully weighed by the Committee on Professional Education and accepted changes will be incorporated in the report before presentation to the Governing Council for action.

## I. THE SCOPE OF ORAL HEALTH NEEDS

Dental diseases and defects probably are the most widely spread of chronic disorders found throughout the world. The important role that oral health plays in the health of the body is receiving general recognition, and demands for competent dental services are constantly increasing. It is obvious that interests and activities directed toward the prevention and control of dental diseases and the maintenance of healthy oral tissues become an obligation of health departments. In recent years, there has been a marked growth of interest in dental public health, and by 1949 the state health departments of 45 states, the District of Columbia, and all territories had established dental health units. Full-time personnel in dental public health programs, during 1949, totaled 626, with 243 employed in state health departments and 383 engaged at the local level.

The specific objectives of dental public health are the prevention, early detection, and correction of the lesions of dental caries; accurate diagnosis, palliative treatment, and interference with malocclusion at the proper age level; instruction in proper mouth hygiene and the prevention and treatment of gingivitis and more involved periodontal disease; the surgical and prosthetic treatment of oral clefts and coöperation in speech rehabilitation; the detection and treatment of other oral anomalies; the early detection of oral cancer; the prompt treatment of all conditions suffered by teeth or jaws involved in accidents; the production of scientifically accurate information; the motivation of proper oral health habits and attitudes on the part of the public; and the development of sound administrative and evaluative techniques for dental public health programs.

Of major interest in the field of public health at present is the practice of dentistry for children. The conclusion has been accepted universally that dental care begun as early as possible for the young child and continued regularly thereafter prevents the need for major mouth rehabilitation in early adult life. At the same time, welfare and rehabilitation programs for adults are increasing.

## II. THE FUNCTIONS OF PUBLIC HEALTH DENTISTS

In addition to intelligent and effective

* This report, like all other statements of the committee on professional and technical qualifications in public health, is subject to periodic revision in order that it may be kept abreast of the best thought.

This proposed report is a revision of the Report on Educational Qualifications of Public Health Dentists approved by the Governing Council on December 6, 1945, and is intended to supersede the earlier report.

participation in general public health work and administration, the public health dentist must assume the specialized tasks incident to a dental health program. He may be expected to keep informed regarding the latest developments in dental research; to maintain competency in directing the details of any service program; to serve as a consultant for oral diagnosis; to provide laboratory facilities for oral diagnoses; to prepare and initiate plans for the dental phases of new health programs, including the facilities; to provide professional advice in developing and supplying authentic and effective dental health educational material; to provide instruction in sound dental health practice to groups of public health workers, teachers, and others; to institute dental research projects which have public health implications; to coördinate the efforts of a variety of agencies, official and nonofficial, that deal with dental health; and to develop specialized indexes and records for measuring and appraising the efficacy of dental health programs.

The progressive dental public health administrator will seek a broad insight into social trends as they affect, or will affect, the practice of dentistry. He will wish to learn how to prepare policies and budgets for an increasing variety of programs. After some experience with the operation of these programs he will want to evaluate them. He will wish to determine policies for his attitude toward and his coöperative activities with other public health divisions, the organized dental profession, and the various community organizations and agencies. He will desire information about personnel classification, merit systems, equipment and materials. All of these activities, and others, grow out of the special problems of administration of the public health dentist.

So much of the dental health education material of the immediate past has been inaccurate or misleading in statement, commercially propagandizing in nature, unattractive in appearance, and not in accord with sound educational practice that the public health dentist should possess the ability to evaluate critically all dental health educational materials. He should be able, also, to secure accurate scientific information, and he should be well versed in the preparation and utilization of effective teaching materials. He should be prepared to serve as consultant in dentistry to the health officer and other public health personnel in regard to dental problems or their solution.

### III. THE EDUCATIONAL BACKGROUND OF PUBLIC HEALTH DENTISTS

For admission to the program of study in dental public health, the candidate must have completed a course leading to the degree of Doctor of Dental Surgery or Doctor of Dental Medicine, in a school of dentistry approved at the time of graduation by the Council on Dental Education of the American Dental Association. An internship, or at least two years' experience in the practice of dentistry, and some experience in public health practice are desirable as additional requirements for admission.

### IV. GRADUATE OR PROFESSIONAL EDUCATION

Consideration of the functions of the public health dentist indicates that there are two distinct phases to his professional specialization: (1) instruction in the general principles and practices of public health in order that the dentist may take his appropriate place in the public health program as a whole, and (2) instruction in those sciences and disciplines which prepare the student to function adequately in dental public health.

1. *Instruction in Public Health:* In order that the dentist may be prepared to assume an appropriate role in the

public health program as a whole, it is apparent that he should include in his program of study courses in biostatistics, epidemiology, sanitation, public health administration, and health education.

2. *Dental Public Health:* Advancement in diagnostic, preventive, and restorative techniques of dentistry now is moving at a rapid pace; therefore, it is essential that dental public health students have opportunity to review the most recent advances in oral bacteriology, pathology, physiology, biochemistry, nutrition, dental materials, operative procedures for children, oral diagnosis, palliative orthodontic treatment, and preventive or control measures. It is recommended that child growth and development and a review of the technical phases of dentistry for children be stressed. The degree of this emphasis will be determined by the student's previous preparation and experience.

It appears advisable, in addition to general courses in administration and health education, that the public health dentist should have a course dealing specifically with problems in the administrative phases of dental health programs. Such problems include the social and economic aspects of the practice of dentistry, the planning and conduct of surveys to acquire essential data, the appraisal of dental health information, the selection of personnel and equipment, and the evaluation of established dental public health programs.

It will be found that there is considerable variation in the preparation of students who enroll in the curriculum in dental public health. Therefore, a wide range of courses offered in several schools and colleges of the university should be open to him as elective subjects. Graduate courses in the school of dentistry will be recommended for most students, and desirable electives may be found in the school of medicine and in the school of education. Courses in the social sciences also may be recommended to professional students in dental public health. Since effective communication is an indispensable tool for the public health dentist, sufficient experience in public speaking and possibly journalism and radio communication is essential.

### V. PERSONAL QUALITIES

It is apparent that the personal qualities of one who is to direct the interests and activities of a dental public health program should be similar to those for directorship in the other fields of public health; namely, intelligence and common sense, adaptability, creative ability, judgment, leadership, enthusiasm, alertness, and good health. Much of the success of the director of a program of dental public health will depend on his capacity to establish favorable public relations and to organize coöperative efforts.

### VI. APPROXIMATE TIME REQUIRED

Satisfactory completion of one academic year of study, or an equivalent period, and sufficient practical field experience in a public health department to satisfy the administrative officer or committee of the school of public health may be considered the usual time requirement. The degree of Master of Public Health (M.P.H.) should have been earned upon completion of this program of study. More extensive field experience or residency training under supervision of a recognized public health agency is advisable for the public health dentist who is to assume important administrative responsibilities.

### VII. TYPE OF INSTITUTION BEST FITTED TO GIVE TRAINING

Since the courses of study, prescribed and elective, which make up a curriculum in dental public health will be offered in several schools of the university, it is apparent that a university which

maintains these necessary schools in a convenient, coöperative relation to each other is in a most favorable position to offer a professional program of study in dental public health. Ideally, the program should be developed in a school of public health, in close coöperation with a school of dentistry. The prescribed courses of study which acquaint the student with the general principles and practices of public health should be completed in common with professional students in other fields of public health.

Obviously, the preceding statement relative to the educational qualifications of public health dentists applies specifically to dentists who anticipate careers as directors or administrators of dental public health programs. A second category of functions of dentists in public health is recognized; namely, professional services in dental clinics which are being established in increasing numbers as part of comprehensive health programs in the public schools, local public health departments and nongovernmental agencies. Increasingly, dentists are being employed, on a part-time or full-time basis, to provide the dental services of these clinics. Dentists thus employed should be thoroughly familiar with the technical requirements of such work. It is apparent that graduation from a school of dentistry approved by the Council on Dental Education of the American Dental Association should be required of a dentist functioning in this category of services.

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## WHAT NEXT IN "RESEARCH AND STANDARDS"

THE Committee on Research and Standards has come of age and now in its 21st year is thinking of man-sized jobs for the next two decades. Dr. Hammon, the fifth chairman, with such notable predecessors as Abel Wolman, L. R. Thompson, Kenneth Maxcy, and Thomas Francis, has called for sound thinking for the future. Two possible directions of effort may strike a spark in the inflammable minds of some of our more volatile, if not yet voluble, members.

While research is in the very atmosphere, political, financial, commercial, as well as in institutions where it is worshiped, it has an inchoate character to the mass. We in public health have a somewhat different order of priorities in mind than have physicians concerned with care of the sick.

What are we anxiously waiting for, so that the already accepted facts of discovery or prevention of disease can be more quickly applied in public health and at minimum cost?

What are the realities of personal hygiene upon which our far-flung claims of health education are in the last analysis based?

We must await the deep knowledge of the basic truths of nature upon which a new mass of practically useful discoveries will be built, but in the meantime there are tests of mass measures and mass results which relatively simple epidemiological methods will refine and make secure. In the hurry and drive to keep up with sometimes hysterical popular demand for instant attention to some temporary enthusiasm, we continue rather thoughtlessly our traditional policies and field procedures. What did well when the tuberculosis death rate was 150 and more per 100,000 per annum may be inexcusably wasteful and unproductive when the rate is 15 or less. Educational handouts for young couples hoping for a son and heir are but wastepaper for the accumulating mass of grandparents out of work. What do we need to know and where can we turn for an answer? Yes! of course to systematic, controlled, imaginative and appropriate research. Well, then, what research is needed for today's and tomorrow's public health?

A list of urgently needed research in laboratory and field might well be prepared and published from the Committee on Research and Standards to give some point and form to the heterogeneous and quite unrelated or interrelated projects bursting upon us with little probability of prompt usefulness. No one should dare to play the prophet and decide for students of the sciences the direction or objective of their research endeavor, but guidance in the relative importance to public health among a number of proposed researches is well within the province of the Committee on Research and Standards.

## THE FAMILY DOCTOR

MOST recent discussion in this country of the British National Health program has tended to confuse the real issues involved. What we really want to know, as a signpost for our own future, is, "What has proved good and what has proved bad in the British experiment?"

There must be something good about a plan which had the wholehearted support of both English political parties in the recent election and which—in general principle—is accepted by the British medical profession. There are also serious defects in the plan, as we are beginning to learn from competent American experts who have thoroughly studied its operation on the ground.

One of these defects—and perhaps the most serious one—is the relationship, or the lack of relationship, between the family physician and the specialist in the hospital and the tendency to domination of the family physician by the specialist. This is by no means a trend limited to compulsory insurance programs. In the United States, where no "plan" is in operation and where the forces of free competition have full play, the same process may be noted. Here, too, we have a drift in the same direction. Prestige and financial reward tend to go to the specialist rather than to the general practitioner; and too often the patient resorts to the specialist without intermediate contact with the family physician. Many forms of surgery will normally be undertaken only on referral; but, more and more, patients have the habit of consulting the dermatologist, the ophthalmologist, the otolaryngologist on their own initiative.

It seems to the writer that this is unfortunate. The human body is not an aggregation of organs but an organism; and it would appear that surgery of all forms, as well as any other specialized type of treatment, should be provided in the light of a knowledge of the total personality concerned. Only the family physician has (or should have) this knowledge. He has observed the reaction of John Smith to specific drugs and to the normal and abnormal stresses of daily life. He knows John's allergies and his powers of adaptation. He has some knowledge of John's hereditary background, which may be a significant element in the picture. He understands something of his emotional responses. The family physician may not use the technical terminology of the psychiatrist—he may even treat such terminology with amused contempt—but if he is a really good family physician he is *ipso facto* a mental hygienist.

It is such a family physician as this who should be primarily in charge of John Smith's health, with every facility of modern specialization at his disposal but with himself as the quarterback who calls the signals. Such a relationship is probably as rare with us in practice as it is in England; but it is the sort of relationship toward which we should consistently strive.

It seems probable that a goal of this kind has been most nearly attained (aside from those families completely uninhibited by economic considerations who have a family physician regularly on call for hygienic guidance) in groups of persons who enjoy the advantages of a prepaid group practice unit. This situation is found in certain localities under the HIP of New York; and in certain coöperative and labor groups. Here there is no financial inhibition to limit resort to the family physician, since the service is prepaid. There is no temptation to use the specialist too little or too much, since no financial competition between one physician and another is involved; and there is opportunity for the fullest and most fruitful continuing coöperation between the family physician and the specialist.

The degree to which such an ideal three-sided relationship between family and family physician and specialist can be attained should be a primary criterion in the judging of any proposal for improving the medical care of the American people.

## THE NEW INTERNATIONAL SANITARY REGULATIONS

WHEN official delegations representing 64 countries at the Fourth World Health Assembly unanimously voted the new International Sanitary Regulations, they not only established greatly improved procedures in foreign quarantine but also affirmed that world law can be written even where interests clash. These Regulations, which from October 1, 1952, will govern all sanitary measures that may be applied to international traffic, will have force of treaty for all Member States of the World Health Organization in so far as specific reservations have not been made before next March.

Interests do indeed clash in matters relating to foreign quarantine. The extraordinary development of civil aviation permits us to reach points in Africa or Southern Asia in two or three days, and the volume of air traffic already exceeds that of maritime traffic, so far as passengers on an international journey are concerned. We cannot afford to lose this advantage on account of quarantine hindrances. On the other hand, we cannot lose sight of the fact that the incubation period of many dangerous epidemic diseases is longer than the time it takes to go around the world. Hundreds of millions of dollars are invested in the means of fast communications, but great epidemics are not less costly.

India and Pakistan are acutely aware that the introduction of yellow fever into their *Aedes*-infested countries might cost tens of millions of lives, and, once established, it would be almost impossible to eradicate the disease on account of the presence of a multitude of susceptible monkeys. Egypt is living in dread of cholera, which caused over 10,000 deaths when last introduced in 1947. Indonesia and the Philippines, too, must keep cholera out. The wool industry of Australia could be ruined should rabies be introduced.

The United States need no longer seriously fear cholera, plague, typhus or yellow fever, which cannot develop into epidemics against our highly developed sanitary defenses. We are still vulnerable to smallpox because in many parts of the country the state of vaccination is not what it should be. Fortunately, our modest quarantine requirements need not interfere with our rapidly growing interests in world traffic.

Until recently the United States policy in matters of foreign quarantine has been highly protectionist. In 1926 and 1933, when ratifying the International Sanitary Conventions for Maritime and Aerial Navigation, respectively, the reservations of the United States amounted to the statement that we would do as we saw fit. In 1951, the United States, together with the United Kingdom and others, has taken the lead in limiting arbitrary action, and we have claimed no privileged position for ourselves.

At present, international rules regarding foreign quarantine are in a state of chaos because of the tardiness of many countries in ratifying the international conventions and failures to abide by them. Thirteen International Sanitary Conventions dating from 1903 to 1944, all of them more or less outmoded, govern the measures which the various countries may take at their frontiers. Some of the newer countries are bound by no agreements. Unnecessary inconveniences to travelers, to shipping and air lines are most serious. Only a few months ago, traffic from Near East countries to Arabia was brought to a standstill on account of a local plague outbreak in a remote village of Yemen.

All of these old conventions and partial agreements will be swept away by the new Regulations, and law and order will prevail from a set date.

The first International Sanitary Conference met in Paris—without success—in 1851, and so the new Regulations are the result of a century's effort. International legislation in this important field became possible not only on account of Articles 21 and 22 of the WHO Constitution, but also because public health workers have developed a sense of international professional solidarity. This awareness of world health as an indivisible whole has received an important impetus through the recent growth of the World Health Organization and the technical assistance projects.

The new approach to the problem which appears in the Assembly resolutions introducing the Regulations is well expressed in the explanatory memorandum of WHO: "A community is more effectively protected against pestilential diseases by its own public health service than by sheltering behind a barrier of quarantine measures." Governments were invited by the Assembly to improve sanitary conditions in their own countries, especially around seaports and airports, and to relax the permitted measures whenever possible.

The text of the Regulations was worked out in a Special Committee to which all countries were invited to send delegations. The Committee met in Geneva, Switzerland, before the World Health Assembly and discussed the Articles in daily meetings for a month on the basis of a draft prepared the year before by the WHO Expert Committee on Epidemiology and Quarantine. The American member of the Expert Committee was Dr. G. L. Dunnahoo, Chief of the Division of Foreign Quarantine, U. S. Public Health Service. The Public Health Service members of the U. S. Delegation to the Special Committee were Dr. Joseph A. Bell, Chief of Epidemiology, National Microbiological Institute, and Dr. Knud Stowman, Foreign Affairs Health Adviser. There were also delegates from the Department of State, the U. S. Air Force and the American Airlines.

Foremost among the principles successfully promoted by the U. S. Delegation was that successful control of international transmission of pestilential diseases, as well as removal of hindrances to international travel, depends in the first instance on immediate and complete information from all parts of the world regarding the appearance of these diseases and all the relevant circumstances. At present, more than half of the restrictive quarantine measures are due solely to the lack of rapid

and reliable information regarding the occurrence of smallpox, rat plague in ports, and jungle yellow fever.

All countries have to report annually to WHO on the workings of the Regulations—another American proposal. Periodic revisions of the Regulations can therefore be undertaken in full cognizance of the facts. Hitherto only personal opinions and theoretical considerations served as guides in the preparation of Sanitary Conventions. Machinery is also set up to settle international conflicts concerning the application of quarantine measures.

Other provisions concern the establishment of transit areas in airports where passengers and crew can be segregated, thus avoiding the measures which may be taken against an infected area.

The eradication of *Aedes aegypti* in a large part of Latin America has been taken into account and *Aedes*-free districts are no longer considered part of the quarantinable yellow fever areas. Measures against plague other than the pneumonic type are now entirely based on control of rodents and their ectoparasites. The provisions for disinsectization and other measures on departure from infected areas have been strengthened.

A smallpox vaccination certificate may be required from any person on an international journey. There is no defense other than vaccination against the spread of smallpox, and this measure seems necessary so long as the disease is so widespread. Keeping up the state of vaccination among those traveling abroad contributes directly to our home defense against smallpox. At the same time, the smallpox certificate was simplified so that a shorter waiting period and fewer signatures are required. No charge may be made for vaccinations performed on arrival.

A simplification of all sanitary documents is noted. Maritime declarations of health, deratting or deratting-exemption certificates and yellow fever, smallpox, and cholera vaccination certificates are the only sanitary documents which may be required for international travel. Radio pratique for ships approaching port is encouraged.

Technically, the new International Sanitary Regulations are undoubtedly a most important step forward, not only in the handling of international travel formalities but also in the measures for control of pestilential diseases. This demonstration of world legislation reveals a startling advance made in international technical collaboration during the last seven years of which we hardly are aware. It was in 1944 that the last International Sanitary Conventions were signed, and in those seven years only 18 ratifications have been obtained. In 1951, professional public health administrators properly accredited by their governments sat down together and worked out a sensible up-to-date plan, keeping human rights and scientific facts in mind, and a year later it will become world law.

We think that perhaps most people are inclined to be too pessimistic when appraising the future of relations between nations.

# Clearing House on Public Health Salary Information and Personnel Needs

## PRIVATE PHYSICIANS EARN MORE THAN SALARIED PHYSICIANS

Physicians in independent practice averaged $11,858 of net income in 1949, compared to $8,272 for salaried physicians excluding interns and residents, according to a study made jointly by the Bureau of Medical Economic Research of the American Medical Association and the Office of Business Economics of the U. S. Department of Commerce.

The study indicates that both independent practitioners and salaried physicians reach their peak earnings between 45 and 50 years of age. The average earning of the practising physician at the peak was $14,967, or 46 per cent above the salaried man's peak of $10,226. Beginning about age 50, earnings gradually decline. By the time they reach 65 both independent and salaried physicians are earning only about one-half of their peak earnings. Thus if a physician who was 45 years old in 1929 is earning the same amount in 1949 as he did then, his income has fallen 50 per cent due to price rises.

The foregoing earnings figures are based on the mean (i.e. arithmetic average) of usable returned questionnaires, numbering about 30,000. The median figure, representing that income below which (and above which) half of all the income recipients fall, is also useful. The median for independent practitioners ($9,668) is 28 per cent above that for salaried physicians ($7,555). It is further significant that the spread between the average and the median salary is much greater among independent practising than among salaried physicians. Average earnings for the former are more than one-fifth greater than median; for the latter group the spread is less than 10 per cent.

Median salaries for salaried physicians specializing in public health and preventive medicine were found by the Commerce-AMA study to be $7,747, while the average was $8,193, or 6 per cent higher. This figure for the full year is somewhat higher than the median salary ranges shown for medical personnel in state health departments in August, 1949 ($7,200–7,400) and in local health departments in April, 1949 ($7,200–7,400) in surveys conducted by the Public Health Service in cooperation with the American Public Health Association and the Association of State and Territorial Health Officers.

The following facts from the survey appear to be of particular interest to public health workers:

1. Salaried physicians were more than one-fifth, or 22 per cent, of the total. The authors caution that this group may be over-represented, since it is easier for its members than for the independent practitioner to fill income questionnaires. With that qualification, the percentage of salaried physicians has increased from 14 per cent since 1940, or nearly two-thirds, reflecting in part, at least, the growth in group practice, industrial medicine, and public health. In the past five years the increase in the percentage of the total represented by salaried physicians has slowed down. The percentage in 1949 was 20 per cent greater than in 1945.

2. All civilian physicians reporting in 1949, including salaried physicians, reported an average net income of $11,058 before taxes and a median income of $8,835.

3. Net income of independent practitioners was about 60 per cent of gross income.

4. Physicians who were members of partnerships are estimated to be about 14 per cent of the total of private practitioners.

5. Members of partnerships had average

earnings of $17,722, compared to $10,895 for practitioners without partners.

6. Full specialists in private practice reported an average net income of $15,014 and a median of $12,599. Pathologists were the second highest paid group of specialists, averaging $22,284 annually. Pediatricians had the lowest average earnings ($12,016) of the twenty-three specialties for which reliable data are available.

7. Physicians' incomes were the highest in the Far West and the lowest in New England. Average earnings rise as size of city increases, up to about 350,000 population, after which income declines. New York City reported a mean net income for nonsalaried physicians nearly 25 per cent below the average for the country; median income more than 25 per cent below that of the entire country.

The individual physician needs to keep the age factor in mind in comparing incomes. Earnings of physicians in general double during the first 20 years out of medical school. Therefore, a physician, class of 1929, who earns twice as much as he did in 1929 is merely even with the earnings curve of his classmates. Rises in income caused by inflation should be considered separately. For example, an independent practitioner who made $3,500 in 1929 could have expected to make $7,000 in 1949 had prices remained the same. Since prices and taxes have doubled his living costs, he can now expect to earn $14,000. The study shows that this is approximately what has happened.

This survey can profitably be compared with the Quantity and Cost Budgets for Executives prepared by the Heller Committee for Research in Social Economics of the University of California for September, 1948. This budget was found to total about $12,500. Thus the $11,858 average earnings of private physicians closely approximate the income needed to achieve the standard of living of executives. The $8,272 average income of salaried physicians is not large enough to pay for the quantity and quality of goods and services used by executive families. However, the peak earnings figures reached at ages 45 to 50 permit a level of living close to the executive level for both independent and salaried physicians ($14,967 and $10,226 respectively).

Reprints of the study, which appeared in the July, 1951, issue of the *Survey of Current Business*, published by the Department of Commerce, may be obtained from the U. S. Government Printing Office, Washington 25, D. C., at 15¢. The *Journal of the American Medical Association* for July 28, 1951, had an analysis of the results of the study. Reprints free. 535 N. Dearborn St., Chicago 10, Ill.

(This material was prepared for Clearing House by Franklin B. Caffee, a member of the Salary Subcommittee, Committee on Professional Education, A.P.H.A.)

## CURRENT SHORTAGES IN PUBLIC HEALTH PERSONNEL

William P. Shepard, M.D., a member of the Health Resources Advisory Committee of the Office of Defense Mobilization, and at that time president of the American Public Health Association, presented a report before the Association of State and Territorial Health Officers at a meeting in San Francisco, October 31, 1951. Copies of the manuscript, entitled "Staffing in State and Local and Public Health Departments," are available from the Health Resources Advisory Committee, Washington, D. C.

Studies of the Health Resources Advisory Committee, Dr. Shepard reported, showed that to maintain even 1949 standards of care and still meet military, civil defense, public health and other mobilization needs would require many more health workers than will be available, and that we may expect by 1954 to have shortages of over 20,000 physicians, 9,000 dentists, and 49,000 nurses.

According to a study made by the Public Health Service and reported by Dr. Shepard, in April of 1951, 9 per

cent of the full-time positions in state and local public health departments were vacant. Trained personnel rather than appropriated funds were lacking. According to Dr. Shepard, the prospects for bringing state and local health departments up to full strength are not bright; in fact, it is more probable that total staffing will decrease rather than increase, as mobilization demands for health personnel are on an upward trend. Dr. Shepard pointed out that to date the extent of loss due to military withdrawals had not been severe—about 1 per cent had entered active military duty by April, 1951. However, many key personnel are members of military reserve units.

Sanitary engineers, for example, are high on the critical list among public health personnel. In April, 1951, public health departments reported a staff of about 1,100 sanitary engineers. This total was 15 per cent short of the budgeted positions and well under the desirable number on which A.P.H.A. studies have been based. In the face of this deficit it becomes doubly imperative that state and local public health departments use to full advantage the available supply of men trained in this field.

There were 11,600 public health nurses on the staffs of state and local public health departments in April, 1951, or about half the desirable number. Vacancies accounted for 8 per cent of the total budgeted positions. About 5 per cent of the nurses held reserve commissions and were subject to mobilization.

Dr. Shepard reported about 2,100 physicians on the staffs of state and local public health departments in April, 1951, together with 300 dentists and 300 veterinarians, all of whom were covered by Public Law 779, the "Doctor Draft Law," which makes males less than 51 years old in these professional categories potentially liable for active military service. Seventeen per cent of all public health department physicians and veterinarians were members of military reserve units and 22 per cent of the dentists. Since present policies call for few occupational deferments, most men in priority groups I and II are slated for military service. State and local health departments should tailor their plans, taking this potential loss into consideration. Physicians and dentists on duty in April, 1951, were estimated to comprise about 80 per cent of the need as expressed by budgeted positions but by A.P.H.A. tests the physicians on duty fell short by one-third of meeting the total need. In terms of the immediate future, according to Dr. Shepard, physicians are the most critical category of personnel covered by Public Law 779 employed in state and local public health departments.

The highest proportion of vacancies in any profession was that of 27 per cent reported for psychiatric social workers. Sanitarians, who were second only to nurses as the largest single class of public health department personnel, filled 94 per cent of their budgeted positions and 11 per cent of them were members of military reserve units.

Dr. Shepard concluded that, since critical shortages exist for most kinds of trained medical personnel, it is the responsibility of everyone concerned to review requirements with the objective of supplying adequate health services with a minimum of health man power.

# Credit Lines

### MEDICAL STUDENTS SEE PUBLIC HEALTH

The exposure of medical students to public health activity can result in contagion. After observing the Family Health Study Program in the Red Hook Health Center, New York City Department of Health, the student yearbook, the *Lichonian*, of the Long Island College of Medicine, comments as follows:

After behaving like specialists for most of our clincal years, we underwent temporary metamorphosis into family doctor during our month on public health. Yes, "Treat the patient as a whole person" had already been drummed into our heads *ad nauseam*, but we had never before adequately appreciated the importance of this homily until our sojourn in Red Hook.

We observed first hand that urban sociology and epidemiology aren't separate subjects. We saw the clinical patient in his native habitat—not as a cirrhotic, hypertensive, or peptic ulcer in a waiting room. We learned that one cannot blithely prescribe bed rest to a mother with 6 children. We got to know our families and their problems rather intimately. We saw homes where there were no bathtubs, no hot water, and no proper toilet facilities. We went into homes where overcrowding, brutality, and alcoholism were more often the rule than the exception. We saw other homes where through the perseverance of one or more individuals, the family miraculously maintained its cohesiveness despite every material disadvantage.

We became acquainted with the social agencies of the city. We interviewed teachers and principals. We saw the variegated activities of the Health Department, from tracing down a typhoid carrier in the best traditions of Scotland Yard, to research on vaccines and nutrition.

Baltic Street will forever be linked with our emergence from the wards of a large city hospital into the outside world—where a soft, blowing systolic murmur is auscultated in between the plaintive wails of a child bawling in the next room.

Credit Lines is indebted to Leona Baumgartner, M.D., deputy commissioner, New York City Department of Health, for this quotation.

### THE PHYSICAL THERAPIST'S JOB

*The Job of the Physical Therapist* is the first part of the American Physical Therapy Association's three year Student Selection Research Project. Designed as a recruitment document to be put in the hands of vocational counselors, it analyzes what the therapist does, the personality demands of the job, and the characteristics essential to success.

The study was done by the New York University Testing and Advisement Center which is doing the three year project. The National Foundation for Infantile Paralysis provided funds for its publication. In format, attractiveness, illustrations, and brevity, it is a model of its kind. American Physical Therapy Association, 1790 Broadway, New York 19; 50¢, reductions for quantity orders.

### TEN YEARS OF NUTRITION SERVICE

*Concerning Food and Health* is the title of the Nutrition Foundation's "report to the public on a decade of adventure in science." Organized in 1941, the Foundation represents the food industry's expression of responsibility for advancing and making greater use of the science of nutrition for human health and well-being. This responsibility has been expressed in research, in training of scientists, and in public education.

In its ten years the Nutrition Foundation has spent nearly three and a half million dollars, two-thirds of the total in basic research and in training of scientists, 11 per cent for public education, and the remainder for direct services and administration. In all, 205 grants have been made to 69 universities and medical centers in support of basic nutrition research. Results have been published in 828 technical papers. The

Foundation does no work in the field of direct or industrial research. A scientific advisory committee whose 14 members serve on a voluntary basis study and approve all research and educational grants before they are recommended to the Board of Trustees for final action.

Fifty-eight firms in the food industry support the Foundation and have representation on a food industries advisory committee to provide a direct liaison with the Foundation's work.

Dr. Charles Glen King is the scientific director of the Foundation. Its headquarters are in the Chrysler Building, New York 17.

### KIWANIS SPASTIC PARALYSIS STUDY

A five year research program on spastic paralysis is planned by the Spastic Child Committee of the Illinois and Eastern Iowa District of Kiwanis International. A fund of $75,000 is being sought through voluntary contributions from members. The money will be used to maintain a specially trained physician at one of the medical schools in the Chicago area to devote his full time and energy to research into the cause, prevention, and treatment of spastic paralysis. When the entire sum is pledged the district will set up a Foundation for Research for Spastic Paralysis to carry out the program. This represents one of the many examples of nonhealth agencies that make definite contributions to health programs.

### A LONE PUBLIC HEALTH NURSE DID IT

In August, 1951, Beaufort County (N.C.) dedicated a $75,000 health center to house its health department which serves a population of about 37,000. The event was reported in the Washington (N.C.) *Daily News* as the "Story of Birth of Health Center," and the subtitle, "Miss Cratt Asked for Fan in 1947; She Got Building Now in Operation." The story is one of a public health nurse's concern for her patients. On a hot August day a local business man walked in and asked nurse Eva Cratt how she was. Noticing the hot, uncomfortable patients, she said everything was fine except she wished she had a fan. The fan arrived that day and the business man, W. A. Blount, Jr., began planning for a health center. Four years later it was a reality.

### LOUISIANA REVIEWS NURSING SCENE

Louisiana has surveyed its situation regarding nursing resources with the help of the United States Public Health Service and has emerged with an arresting, effective, and well presented report. Probably the story of supply, need, and deficit could be duplicated in many states of the Union. The report is worth reading from every point of view. Perhaps the chief message is on the last page—succinctly stated as, "Nursing + Public Support Means Better Health." To be congratulated is the Louisiana State Nurses Association, 2605 Prytania St., New Orleans, from which the report may be secured.

### COÖPERATION IN GARBAGE DISPOSAL

Ten cities in Oakland County, Michigan, adjoining Detroit, have agreed jointly to construct an incinerator for the disposal of garbage and rubbish. Since suitable dumping sites in distant areas threatened to increase disposal costs the city managers employed a consulting engineer to make a survey with recommendations. The plan for joint disposal to serve this area of 180,000 persons under a Southeastern Oakland County Garbage Authority was the result. The way is left open for other cities to contract with the authority for refuse disposal.

Before this joint action the 10 cities had already for several years had a joint agreement for sewage disposal and the construction of an interceptor sewer to deliver sanitary sewage to Detroit's disposal system. Furthermore, they are all

provided public health services by the Oakland County Health Department.

This story is fully recorded in *Public Management* for November, 1951, 1313 E. 60th St., Chicago 37.

### A DIRECTORY OF HEALTH FILMS

Wisconsin is among the most recent state health departments to issue a directory of health films. Attractively produced, it has a listing both by subject and alphabetically. It is illustrated with humorous drawings that help to focus on the description of the film. All the films listed are loaned without charge in Wisconsin.

As a heart disease health education device the Wisconsin Department also has designed new stationery for short notes. On the bottom it has a drawing with the message, "Take It Easy, You'll Live Longer." Notepaper size, the film, "Guard Your Heart," is described briefly on the back. Wisconsin Health Department, Madison 2, Wis.

### A NEW ALCOHOLISM PUBLICATION

*Alcoholism*—Vol. 1, No. 1, A Treatment Digest for Physicians has made its appearance as an attractive quarterly publication of the New Jersey State Department of Health. The digest will contain abstracts of scientific papers as well as items of local interest. The abtracts of scientific articles are prepared by the editorial department of the *Quarterly Journal of Studies on Alcohol*, Laboratory of Applied Physiology, Yale University.

### KEEPING A SURVEY IN THE PUBLIC EYE

The Philadelphia Public Health Survey was published in March, 1950. Things have been happening since then. Some of them are reported in *Public Health: Your Responsibility* prepared by the Health and Welfare Council of Philadelphia. The Survey's recommendations are summarized and what still remains to be done indicated. Its timing is designed to keep up citizen interest in a story that is no longer new. In small compass it gets over a good deal of education about health centers, nursing programs, mental hygiene, and other services. Its final page is "What *you*, personally can do about it."

Among the recommendations that have already been carried out are reported the appointment of a chief of the Division of Health Center Administration and five centers in operation, four with full-time directors. Two other centers are under construction. Chiefs of the nursing and health education services have been appointed. Health and Welfare Council, 311 So. Juniper St., Philadelphia 7.

### WATER SOURCES FOR NEW YORK CITY

*Future Water Sources of the City of New York* demonstrates the complexity of the problem confronting many cities in assuring future water needs. Written by the Engineering Panel on Water Supply to the Mayor's Committee on Management Survey of the City of New York, the report covers one phase of the committee's studies of New York City now under way. It analyzes future water requirements of the city up to the year 2000 and discusses various proposals that have been advanced to obtain the needed additional sources of water. Included is a plan for new sources as recommended by the panel, as well as recommendations for increased emphasis on water conservation that of itself could save more than one-tenth of the present daily water use. Copies from Miss Larkin, Mayor's Committee on Management Survey, 250 Church Street, New York 13, N. Y. Free.

### POLLUTION OF BOUNDARY WATERS

That international coöperation can be obtained without resorting to threats of arms is proved by the *Report of the International Joint Commission—United States and Canada—on the Pollution of*

*Boundary Waters, 1951.* On reference by the two governments, the International Joint Commission undertook the task of determining whether certain boundary waters between Lake Superior and Lake Ontario were being polluted to the injury of health or property; if so, to what extent; what remedial action should be taken; and the nature and location of needed treatment facilities. Boards of technical advisers, composed of representatives from both countries, undertook the necessary field studies. This report presents the results of the studies conducted from July, 1946, to November, 1949, and the recommendations of the advisers. A wealth of technical detail, well illustrated, obtained during the field investigations is included in the report.

Further information from the International Joint Commission for Boundary Waters, Ottawa, Canada, or Washington, D. C.

EARLY DAYS OF MILK SANITATION

*Milk in America—Its Story as Told in Philadelphia's Dairy Museum* by David M. Gwinn is a well illustrated, instructive, historical account of the development of the milk industry. Milk sellers appeared on Philadelphia streets about 1825. The methods and complications of keeping cows in the cities, of the dairies associated with the breweries where the cows consumed the swill and of the prevalence of adulteration are vividly described. The story appears in the fall number of *American Heritage* published by the American Association for State and Local History, 73 Main Street, Brattleboro, Vt. The Dairy Museum is more accessible at the Pennbrook Milk Company in Philadelphia.

ANNUAL REPORTS

*Wider Horizons* is the annual report of the Association for the Aid of Crippled Children for the year ending March 31, 1951. The wider horizons are the new responsibilities created and activities made possible by the Belding Endowment gifts of some 12 million dollars. The Association is no longer for the aid of crippled children alone, but is also for the prevention of crippled children.

During the year the Association has begun transfer of its home nursing and therapy services to the visiting nurse service in the belief that a specialized orthopedic service as an integral part of a broad public health nursing service has advantages for the handicapped child and his family. It has also pioneered in making possible a Children's Division in the Institute of Physical Medicine and Rehabilitation in the New York University-Bellevue Medical Center.

Leonard Mayo is the director of the Association; its headquarters are at 580 Fifth Ave., New York City.

*A Longer and Healthier Life* is the title of the 43rd biennial report of the Wisconsin State Board of Health for the period ending June 30, 1950. It is a detailed, factual report, well printed and liberally illustrated with photographs of innumerable activities of the department. The photographs are unusually clear-cut and well focused. State Office Building, Madison 2.

*Oakland's Health, 1950 Annual Report* of that city's Health Department follows what appears to be the trend in 1950 annual reports. It is short, matter of fact, and illustrated with actual photographs of departmental activities. Of ten communicable diseases, the reported cases in 1950 were far below the 1946–1950 annual average, except for tuberculosis cases, which were slightly more numerous, and mumps, cases of which were 8 per cent more numerous in 1950 than in 1949 and one-third more numerous than the five year average.

# BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.*

**The Facts of Life from Birth to Death**—*By Louis I. Dublin. New York: Macmillan,* 1951. 461 pp. Price, $4.95.

The facts of life from birth to death are given through well chosen answers to eleven hundred questions. These include valuable data regarding birth, death, marriage and divorce, the specific causes of illness and death, such as tuberculosis, cancer, the circulatory diseases, diabetes, rheumatic fever, accidents, etc. Even such subjects as the effects of war, with the numbers of lives lost, the administration of public health work, and body build are covered.

Some of the questions ask for definitions of such terms as health, a family, tuberculosis, and cancer. The definitions which are included will make the book useful to college students and laymen who frequently wish answers to these questions.

The questions and answers are given in such interesting form that the book can easily be read from cover to cover by any person concerned with health. He will find many facts so readily accessible that he can use the book for reference when he needs the answers quickly to such specific questions.

The book is recommended for use by all health workers, for they are constantly being asked these questions. Also, it is recommended for reading and reference for many others such as doctors, nurses, welfare workers, sociologists, and students in these fields who are interested in facts regarding the vital events of life.

RUTH R. PUFFER

**Food for You**—*By Edmund Sigurd Nasset. Springfield, Ill.: Charles C Thomas,* 1951. 100 pp. Price, $3.00.

This monograph on nutrition is addressed to the author's two college-age daughters who are not studying in this field. It is written in easy-to-understand language with the assumption that an intelligent lay reader welcomes a few technical terms where necessary for clarity and wants to know the whys and hows of the subject.

According to the author, he aims to provide an introduction to the normal processes of digestion and utilization of food, the nature of foods required for health, and the importance of proper methods of processing and cooking to insure obtaining the best possible value from food.

Nutrition, a subject of world-wide proportions, becomes a very personal one several times a day and good interpreters of this science are most welcome. Dr. Nasset has made the approach to each phase of the subject straight to the point without wasting words. He tells a story without reference to authors or original investigators, but gives enough of the research method to show how new facts are discovered. He has a wholesome respect for the marvelous chemical and physiologic devices which make the human machine tick and he takes every opportunity to call attention to specific instances where nature's plan meets a need in a unique fashion.

This little book has a place in the public libraries for lay readers as well as on a professional shelf.

HELEN S. MITCHELL

**Journey Together**—*By Turnley Walker. New York: David McKay,* 1951. 144 pp. Price, $2.50.

This short report is the sequel to Mr. Walker's book *Rise Up and Walk* and continues the story of his recovery from

poliomyelitis. Like the first book it is readable, encouraging to other handicapped persons, and reveals the same rugged determination to conquer this misfortune. Mr. Walker is lucky in having an unusually wide variety of inner resources and talents. He sings, he writes, he drives a car, he loves pets, he reads, he makes friends easily, he has his children.

But the real credit for his recovery, indeed for these books, goes to Flora, his wife. The greatest interest in and value of this book to professional readers is the study of Flora's handling of her husband's "case." Whether he knew it or not, Mr. Walker has described situations which offer perfect illustrations of the appropriate "psychological approach" to this patient.

It is rewarding reading.

DOROTHY DEMING

**Psychological Dynamics of Health Education**—*Proceedings of the Eastern States Health Education Conference, April 13–14, 1950. New York: Columbia University Press,* 1951. 134 pp. Price, $2.50.

The chief focus of the papers presented at the Eastern States Health Education Conference in 1950 was on the dynamics of motivation in relation to individual and group behavior. A distinguished group of speakers discussed various aspects of this crucial problem in health education, and the papers are now presented in printed form in the volume under review. While none of the papers even presumes to offer an intensive discussion, many of the presentations are highly provocative and will probably stimulate the reader to some intensive thinking.

Among the participants are John C. Whitehorn, who deals with the motivating pattern of the normal individual; Phyllis Greenacre discusses adolescence; Thomas A. C. Rennie analyzes parents; and William Malamud's subject is the older age group. The psychology of the group in relation to health education is taken up by Leo W. Simmons, Earl Lomon Koos, Leo Srole, and Mark Starr. D. B. Armstrong, Jr., discusses mass media, publicity and advertising. Motivation in nutrition, in relation to specific diseases and hospital services, is analyzed by Paul V. Lemkau, Elizabeth Lockwood, John A. Morsell, and Ernest Gruenberg.

All public health workers will find much of value in this book. It is easy to read, and in this reviewer's opinion the subjects presented are in some instances excessively simplified. For readers who might be interested in pursuing specific topics further, it would have been of value to have a select bibliography at the end of each paper. There is no index.

GEORGE ROSEN

**Thomson's Modern Public Cleansing Practice — Its Principles and Problems**—*By John Stephen (3rd ed.). London: Technical Publishing Co., Ltd.,* 1951. 425 pp. Price, 42*s.*, net.

This book covers the broad field of the collection and disposition of municipal wastes of all kinds, street cleaning and sanding, as well as snow removal. The establishment of self-contained municipal cleansing departments is encouraged and the heads of such departments are urged to acquire the broad technical knowledge necessary for the satisfactory and economic operation of such services.

A brief history of public cleansing is followed by a discussion of public cleansing and health. Public cleansing is pictured as a fundamental health service whose contribution to human welfare cannot be measured in terms of rates or money. Reference is made to supporting evidence in a report of the Committee on Refuse Collection and Disposal of the A.P.H.A.

Data are given on the composition and characteristics of town refuse, de-

vices and arrangements for its temporary storage on the premises, programs and equipment for its collection and removal, and types of vehicles used. Disposal methods discussed include land reclamation, dumping at sea, screened separation for salvage, incineration, and salvage and utilization.

Other chapters are devoted to the cleansing of streets, gritting or sanding, and snow removal. Still others deal with education, publicity, management, records, statistics, costs, trade refuse, codes and legal sanctions.

The coverage is comprehensive and particularly valuable to students of English practice. Special points of difference with practice in the United States are the direct responsibility of English municipalities for the collection and disposition of all wastes and the combined collection of such wastes. A chapter is devoted to pointing out the difference in practices in other countries and cities. WALTER D. TIEDEMAN

**Atlas of Framboesia**—*By Kenneth R. Hill, R. Kodijat, and M. Sardadi. Geneva, Switzerland: World Health Organization*, 1951. 52 pp. Price, $1.00.

The object of this study is to describe the skin manifestations of yaws, with the aid of photographs, and to name the lesions in order that through uniform nomenclature the current programs of yaws control in Haiti, Thailand, and Indonesia may be promoted. The descriptions relate to what may be seen by the naked eye and are in a form sure to be of use to doctors and nurses in the field.

Sixteen kinds of skin lesions of yaws are described and their synonyms are given. The illustrations are superb and should make it possible for persons otherwise unfamiliar with the disease to classify cases.

This is an excellent addition to the monograph series of WHO.

REGINALD M. ATWATER

**Vitamin Methods. Volume II**—*Edited by Paul György. New York: Academic Press*, 1951. 712 pp. Price, $14.50.

Results provided by animal assay afford more reliable criteria of the nutritional value of the vitamins than can be got with physical, chemical, and microbiological methods. The literature on the subject is extensive and it is a convenience, especially to the beginner, to have in one volume lucid instructions and explanations on general aspects of small animal experimentation and animal assay procedures. The chapter on animal assay of the vitamins includes procedures for determination of vitamins A, D, E, and K and the water-soluble vitamins, thiamin, riboflavin, niacin, pyridoxine, pantothenic acid, biotin, folic acid, vitamin $B_{12}$, and ascorbic acid.

The chapter on statistical methods in vitamin research is an important element, since the statistical approach is indispensable in the interpretation of assay results.

The chapters on the laboratory diagnosis of human vitamin deficiencies and clinical signs of malnutrition should prove useful as a reference guide for clinical research laboratories. The organization and presentation of each of the methods recommended and the careful and detailed descriptions of reagents, apparatus, and procedures give added usefulness to the chapter on laboratory diagnosis of human vitamin deficiencies. Inclusion of a range of normal values would add to the value of this chapter.

The last 102 pages of this book are a supplement to Volume I on Physical, Chemical, and Microbiological Methods in Vitamin Research. The extensive bibliographies at the end of each chapter and the subject and author indexes add further to the usefulness of this book. It should serve research workers and clinical investigators as a reference book as well as a laboratory manual. It is an excellent work and has the qualities that

one would expect from so eminent an investigator as the editor.

ERNESTINE BECKER MCCOLLUM

**A Manual for the Control of Communicable Diseases in California**—*Compiled by the California State Department of Public Health (2nd ed.). San Francisco: California State Department of Health*, 1951. 228 pp. Single copies free.

This volume is based largely on the 7th edition of *Control of Communicable Diseases in Man*, published in January, 1950, by the American Public Health Association. Revision from the original or substitutions have been made chiefly to conform with existing regulations and statutes in California. Additional information on the laboratory diagnosis of the communicable diseases is given, with listing of the diagnostic tests available in local laboratories or in the State Health Department's Laboratory Division. Immunization procedures include the specific procedures recommended by the State Health Department and the California Conference of Local Health Officers. A section on public health nursing responsibilities has also been added for each disease which details the specific activities the public health nurse should carry out in the control of the disease. An appendix quotes the provisions of the California Health and Safety Code for Quarantine of Communicable Diseases.

This is a good example of the uses to which the Association's manual may be put. California has developed a pattern that may be useful in other states.

MARTHA LUGINBUHL

**Directory of Fellowship Awards, 1917–1950, The Rockefeller Foundation.** *New York: Rockefeller Foundation*, 1951. 286 pp.

The President of the Rockefeller Foundation, Mr. Chester I. Barnard, points out that the granting of fellowships has always been one of the primary interests of the Rockefeller Foundation. It began during the first World War and grew gradually until by 1950 there were 6,342 persons who had received fellowships representing 75 countries and an investment of about $19,000,000. An additional amount of half this sum was given to other organizations for their own fellowship programs.

This report is an excellent illustration of the basic principle of this fellowship program, which is a conviction that individuals can and should be developed for future leadership and creative achievement in important fields of endeavor. There have been no bars to the crossing of racial or national boundaries. Beside the technical information acquired there has been a significant lifting of the level of international coöperation and understanding. Of the total awards, 40 per cent have been under the International Health Division of the Foundation, with approximately an equal number divided under the medical sciences and natural sciences divisions, with the social sciences and humanities making up the remainder.

The report modestly points out that fellowships are uncontrolled experiments in the sense that the kind of record that might have been established without the fellowship remains unknown. It is safe to assume that many of these young persons would have had distinguished careers even without the help of the fellowships, and the Foundation does not claim for itself more than what fellowship holders themselves have affirmed, namely, that the fellowship experience, wisely planned and coming at a crucial developmental juncture, can contribute significantly to future achievement. This is a magnificent report representing an unprecedented venture consistently developed for a third of a century. The Foundation is to be congratulated on the venture itself and on an outstanding report.

REGINALD M. ATWATER

**Man and His Years.** *An Account of the First National Conference on Aging —Sponsored by the Federal Security Agency (at the request of the President of the United States). Raleigh, N. C.: Health Publications Institute,* 1951. 311 pp. Price, $1.75 Paper Bound; $3.25 Cloth Bound.

This is the official record of the first forum of *national* scope on the subject of aging, the natural and timely culmination of a series of similar conferences previously held throughout the country. The account understandably fails to convey the unusual quality of spirit, the high degree of enthusiasm, and the sense of stimulation which were outstanding characteristics of the meeting. It does, however, something much more important.

It records faithfully the interest, opinion, and thinking of more than 800 participants. It clarifies many of the major issues which the aging of the population of the United States raises for solution through carefully directed study and action by man himself, his home town and state, and the nation.

In this compilation of the reports of eleven individual working groups there is inevitably overlapping and duplication in content, but this apparent fault is actually its greatest virtue. The primary needs of older people and of the society in which they live are objectively identified, examined, and analyzed in relation to the special facet of daily life with which a given section was charged. Each chapter, then, becomes an independently valuable source of reference both as to needs and recommended action or program on its particular topic. For those concerned with the future well-being of older people and of the people of whom they constitute a growing proportion, the book in its entirely is a "must."

OLLIE A. RANDALL

**America's Baby Book**—*Prepared under the auspices of the Herald-Tribune Home Institute by John C. Montgomery and Margaret Jane Suydam. New York: Scribner's,* 1951. 441 pp. Price, $3.50.

The title of this book is so intriguing and so authoritative that public health workers will need to become familiar with it in order to keep abreast of the questions asked by enterprising parents. It is a book of over four hundred pages, with a good index. Its size and comprehensiveness make it valuable as a reference book. More information about care of the teeth, about selection of shoes for the preschool child, and about posture would have been helpful. The pictures are delightful and are very informative.

Its strongest features are: (1) its thorough descriptions of feelings of infants, with sound advice on methods of discipline of the infant, and (2) practical suggestions for household management in the city. Medical advice in the form of health instruction throughout the book is carefully presented. Particularly well presented are the suggestions to parents for the care of their children during convalescence and for the parents' conduct in the hospital when their child is hospitalized.

MARTHA L. CLIFFORD

# BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.*

ACCEPTED DENTAL REMEDIES, 1952. Council on Dental Therapeutics, American Dental Association. Chicago: American Dental Association, 1952. 211 pp. Price, $1.50.

ADRENAL CORTEX. TRANSACTIONS OF THE SECOND CONFERENCE, NOVEMBER 16–17, 1950. Edited by Elaine P. Ralli. New York: Josiah Macy, Jr. Foundation, 1951. 209 pp. Price, $3.00.

AGING, PROBLEMS OF. TRANSACTIONS OF THE 13TH CONFERENCE, FEBRUARY 5–6, 1951. Edited by Nathan W. Shock. New York: Josiah Macy, Jr. Foundation, 1951. 194 pp. Price, $4.00.

ANALYSIS OF THE MULTI-TEST CLINIC OF RICHMOND, VA. Walter E. Boek. New York: Health Information Foundation, 1951. 267 pp. Price, $1.50.

ANTIBIOTICS NUMBER. JOURNAL OF THE HISTORY OF MEDICINE AND ALLIED SCIENCES. VOL. VI, No. 3. New Haven, Conn.: Yale University, Department of the History of Medicine, 1951. Pp. 279 through 437. Price, $2.50.

ANTIMETABOLITES, A STUDY OF. D. W. Wooley. New York: John Wiley, 1952. 247 pp. Price, $5.00.

APHORISMS OF C. H. MAYO AND WILLIAM J. MAYO. Collected by Frederick A. Willius. Springfield, Ill.: Charles C. Thomas, 1952. 109 pp. Price, $2.75.

BATTLE FOR MENTAL HEALTH. James Clark Moloney. New York: Philosophical Library, 1952. 105 pp. Price, $3.50.

BLOOD PRESSURE, FACTORS REGULATING. TRANSACTIONS OF THE FIFTH CONFERENCE, FEBRUARY 15–16, 1951. Edited by Benjamin W. Zweifach and Ephraim Shorr. New York: Josiah Macy, Jr. Foundation, 1951. 238 pp. Price, $3.75.

CARDIOLIPIN ANTIGENS. WHO Monograph Series No. 6. Mary C. Pangborn, et al. New York: Columbia University Press, 1951. 63 pp. Price, $1.00.

CHILDREN FROM SEED TO SAPLINGS (2nd ed.). Martha May Reynolds. New York: McGraw-Hill, 1951. 334 pp. Price, $3.75.

COMMUNITY PLANNING FOR HUMAN SERVICES. Bradley Buell and Associates. New York: Columbia University Press, 1952. 451 pp. Price, $5.50.

COMMUNITY ORGANIZATION AND AGENCY RESPONSIBILITY. Ray Johns and David F. DeMarche. New York: Association Press, 1951. 274 pp. Price, $3.75.

COST OF SICKNESS AND THE PRICE OF HEALTH. WHO Monograph Series No. 7. C.-E. A. Winslow. New York: Columbia University Press, 1951. 106 pp. Price, $1.50.

DIGEST OF SEWERAGE ENABLING ACTS OF THE STATE OF CALIFORNIA. State Water Pollution Control Board. Sacramento, Calif.: Documents Section, State Printing Division, 11th and "O" Streets, 1951. 39 pp. Price, $.50.

EMOTIONAL FACTORS IN CARDIOVASCULAR DISEASE. Edward Weiss. Springfield, Ill.: Charles C. Thomas, 1951. 84 pp. Price, $2.25.

EVALUATION OF THE TESTS OF GENERAL EDUCATIONAL DEVELOPMENT. Paul L. Dressel and John Schmid. Washington, D. C.: American Council on Education, 1951. 57 pp. Price, $1.00.

ENGINEERING BULLETIN. PROCEEDINGS OF THE SIXTH PURDUE INDUSTRIAL WASTE CONFERENCE. Lafayette, Ind.: Purdue University, Dean A. A. Potter, Executive Building. 506 pp. Price, $1.25.

GALEN'S HYGIENE, A TRANSLATION OF. Robert Montraville Green. Springfield, Ill.: Charles C. Thomas, 1951. 277 pp. Price, $5.75.

GYNECOLOGIC NURSING (4th ed.). Robert James Crossen and Ann Jones Campbell. St. Louis: Mosby, 1951. 256 pp., 167 illus. Price, $3.50.

GROUP TREATMENT IN PSYCHOTHERAPY. Robert G. Hinckley and Lydia Hermann. Minneapolis: University of Minnesota Press, 1951. 133 pp. Price, $3.00.

INSANITY LAWS. W. R. Dittmar. New York: Oceana Publications, 1951. 96 pp. Price, $1.00 paper and $2.00 cloth.

INTERGOVERNMENTAL RELATIONS IN PUBLIC HEALTH. Research Monograph No. 4 on Intergovernmental Relations in the U. S. Laurence Wyatt. Minneapolis: University of Minnesota Press, 1951. 212 pp. Price, $3.50.

IT'S MINE! STORY AND PICTURES. Elly McKean. New York: Vanguard Press, 1951. Unpaged. Price, $2.00.

LIVER INJURY. TRANSACTIONS OF THE NINTH CONFERENCE, APRIL 27–28, 1950. Edited by F. W. Hoffbauer. New York: Josiah Macy, Jr. Foundation, 1951. 232 pp. Price, $3.00.

MEASUREMENT AND EVALUATION IN PHYSICAL

HEALTH AND RECREATION EDUCATION. Leonard Larson and Rachael Dunaven Yocum. St. Louis: Mosby, 1951. 507 pp. Price, $7.50.

NATIONAL HEALTH SURVEY, 1935–36. SCOPE, METHOD, AND BIBLIOGRAPHY. Public Health Bibliography Series, No. 5. Washington: Govt. Ptg. Office, 1951. 67 pp. Price, $.30.

NERVE IMPULSE. TRANSACTIONS OF THE SECOND CONFERENCE, MARCH 1–2, 1951. Edited by David Nachmansohn. New York: Josiah Macy, Jr. Foundation, 1951. 204 pp. Price, $3.50.

NEWER ETHICAL PROBLEMS IN MEDICINE AND SURGERY. Bernard J. Ficarra. Westminster, Md.: Newman Press, 1951. 157 pp. Price, $3.75.

NURSING IN OHIO. A History. James and Mary Jane Rodabaugh. Columbus: Ohio State Nurses' Association, 1951. 255 pp. Price, $4.00.

NUTRITION AND CLIMATIC STRESS, WITH PARTICULAR REFERENCE TO MAN. H. H. Mitchell and Marjorie Edman. Springfield, Ill.: Charles C. Thomas, 1951. 244 pp., 8 illus. Price, $6.75.

PATHOGENESIS OF TUBERCULOSIS (2nd ed.). Arnold R. Rich. Springfield, Ill.: Charles C. Thomas, 1952. 1018 pp., 105 illus. Price, $15.00.

ORIENTATION TO THE COMMUNITY IN THE BASIC CURRICULUM. Isadora Denike. Washington, D. C.: Author, Freedmen's Hospital, Sixth and Bryant, N.W., 1950. 77 pp. Price, $2.00.

PRACTICE OF MARRIAGE COUNSELING. Emily Hartshorne Mudd. New York: Association Press, 1951. 325 pp. Price, $4.50.

PSYCHOANALYTIC STUDY OF THE CHILD. VOL. VI. Edited by Ruth S. Eissler, Anna Freud, et al. New York: International Universities Press, 1951. 398 pp. Price, $7.50.

REHABILITATION NURSING. Alice B. Morrissey. New York: Putnam's Sons, 1951. 299 pp. Price, $5.00.

RENAL FUNCTION. TRANSACTIONS OF THE SECOND CONFERENCE, OCTOBER 19–20, 1950. Edited by Stanley E. Bradley. New York: Josiah Macy, Jr. Foundation, 1951. 178 pp. Price, $3.00.

SELF ANALYSIS. L. Ron Hubbard. Wichita, Kans.: The Hubbard Dianetic Foundation, Inc., 1951. 106 pp. Price, $2.50.

SOCIAL MEDICINE IN WESTERN EUROPE. Report of a World Health Organization Traveling Fellowship Summer, 1950. E. Richard Weinerman. Berkeley, Calif.: School of Public Health, University of California, 1951. 82 pp.

STATISTICAL ABSTRACT OF THE UNITED STATES (72nd ed.). U. S. Department of Commerce, Bureau of the Census. Washington: Govt. Ptg. Office, 1951. 977 pp. Price, $3.00 buckram.

TEACHERS CONTRIBUTE TO HEALTH. Elsa Schneider and Simon A. McNeely. FSA, Office of Education. Washington: Govt. Ptg. Office, 1951. 44 pp. Price, $.20.

TRANSACTIONS OF THE CONFERENCE ON MINISTRY AND MEDICINE IN HUMAN RELATIONSHIPS, MAY 11, 1950. New York: New York Academy of Medicine, 1951. 75 pp.

UNITED STATES PUBLIC HEALTH SERVICE, 1798–1950. Ralph Chester Williams. Washington, D. C.: Commissioned Officers Association of the USPHS, 1951. 890 pp. Price, $7.50.

WESTERN BRANCH, A.P.H.A. THE ANNUAL, 1950. Berkeley, Calif.: University of California, Western Branch, A.P.H.A. 65 pp.

# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Comforting Findings**—Almost anything you might want to know statistically about influenza you'll find here. As with our other common communicable diseases the case rate declines generally despite local outbreaks.

COLLINS, S. D., AND LEHMANN, J. Trends and Epidemics of Influenza and Pneumonia 1918–1951. *Pub. Health Rep.* 66, 46:1487 (Nov. 16), 1951.

**How To Interview**—This tells industrial nurses the ways to make a productive interview. Nine rules are enumerated, but mostly it is a matter of successful listening. A good many health workers other than nurses could profit by reading this paper—and the reading would call for very little translation by them in order to apply the ideas to their own business.

DANIELS, H. W. Interviewing in Industry. *Pub. Health Nursing* 43, 12:675 (Dec.), 1951.

**A Little Due for the D-v-l**—Three British doctors visited the Soviet Union and came away praising the preventive phases of what public medical services they were permitted to see in the great cities.

GILLILAND, I., *et al.* Soviet Medicine. *Brit. M. J.* 4737:966 (Oct. 20), 1951.

**Educator's Tribulations** — As quickly as pedagogical hurdles can be jumped, let's replace the Schafer prone-pressure method by a more productive push-pull method of resuscitation, urge these writers. Ah well, here today, gone tomorrow (or, more elegantly) *tempus edax rerum!*

GORDON, A. S., *et al.* Critical Survey of Manual Artificial Respiration. *J.A.M.A.* 147, 15:144 (Dec. 8), 1951.

**Criminal Neglect?**—Nutrition activities of the Public Health Service, sunk without a trace by the Bureau of the Budget, should be reinstated by an enlightened Congress. This is the recommendation of an impartial observer.

JOLLIFFE, N. Critical Evaluation of Public Health Programs in Nutrition. *J.A.M.A.* 147, 15:1411 (Dec. 8), 1951.

**Psychiatric First Aid**—Brief though it is, this summation of the emotional and mental crack-ups that can, and do, occur among industrial workers may bring some insight and help to a harassed health administrator. For, in a small way, public health administration is, or should be, an industry.

MORIARTY, J. D. Psychiatric Casualties in Industry. *Indust. Med. & Surg.* 20, 12:538 (Dec.), 1951.

**Dangerous Trade**—Suggesting the tenor of this discussion is the last sentence: vaccination with BCG should under no circumstances be employed as a substitute for those measures which have proved so effective in preventing infection with tubercle bacilli.

LEES, H. D. Tuberculosis in Medical Students and Nurses. *J.A.M.A.* 147, 18:1754 (Dec. 29), 1951.

**N. B.**—"More than 1,200 mental health clinics are now in operation in the United States . . ." That is a statistic with very broad implications in matters

of our country's welfare. And may the rapid rate of expansion long continue!

PENNELL, M. Y., *et al.* Mental Health Clinic Services for Children in the United States, 1950. *Pub. Health Rep.* 66, 48:1559 (Nov. 30), 1951.

**Why They Drink Wine**—Some of the sanitary deficiencies that this trained observer saw in the most romantic European countries will do much to reconcile us stay-at-homes. WHO is doing a lot but the hazards are likely still to be there when most of us are no longer here.

PINCUS, S. H. The World Health Organization. *Modern San.* 3, 12:33 (Dec.), 1951.

**Symposium on Aging**—From the first sentence of the first paper to the last sentence of the fifth (a 75-word affair, by the way, but solid meat) these papers are of top-drawer interest to health workers. The opening sentence is: "All competent speech instructors advise the neophyte to commence his address with some sort of shocking statement: he should say something unusual about the usual." (This relayed advice is quite apart from the topic but gilt-edged nonetheless.)

SCHEID, P. N. Training the Overage Employee for Retirement (and four related papers). *J.A.M.A.* 147, 14:1323 (Dec. 1), 1951.

**Danger: Men at Work**—In the laboratory, diseases have been acquired from every known variety of infectious agent and by every variety of worker—professional, technical, student, clinical, and maintenance—even by visitors. Safety measures are discussed.

SULKIN, S. E., AND PIKE, R. M. Laboratory-Acquired Infections. *J.A.M.A.* 147, 18:1740 (Dec. 29), 1951.

**Lest We Forget**—The war (against *T. pallidum*) isn't over by many long shots, warns this writer, and we'll need trained personnel (not now being trained) if future retreats are to be avoided. Four ways to fight the cleanup campaign successfully are set down and you should know something about them.

THOMAS, E. W. The Influence of Modern Treatment on Syphilis Control. *Pub. Health Rep.* 66, 48:1573 (Nov. 30), 1951.

**When Eyes Feed the Ears**—Illustration after illustration, taken from flip charts prepared to aid visually some talks on safe food-handling practices give this brief paper a practicality that would be difficult for a whole chapter of fine-spun theorizing to achieve.

THOMPSON, M. H. The Education of Food Establishment Employees by Flip Chart. *Modern San.* 3, 12:20 (Dec.), 1951.

**"We Know a Good Deal More"**—Belatedly, there appears a condensation of the papers making up the symposium on child growth and development presented at our St. Louis Annual Meeting. Better late than you-know-when surely applies to this collection.

WASHBURN, A. H., *et al.* Why Be Interested in Child Growth and Development? (and three related papers). *The Child* (Children's Bureau) 16, 4:50 (Dec.), 1951.

# Public Health in Foreign Periodicals

GEORGE ROSEN, M.D., PH.D., F.A.P.H.A.

ONE of the most significant developments in the world today is that hitherto backward peoples are slowly awakening to the existence of better ways of living, of which freedom from disease is an exceedingly important part. In the course of the next fifty years, Africa will undoubtedly occupy a prominent place in this process. While many Africans still are employed on farms and plantations, they are being recruited to an increasing degree to work in factories and mines. This process of industrialization and urbanization will very likely increase in tempo and scope. As the white and nonwhite peoples of Africa become more and more subject to these new conditions, problems of public health and medical care, already in evidence, will probably present themselves more urgently for solution. From the current literature it is possible to survey some of the problems being faced at present, and to see some of the solutions that are being attempted.

## HOUSING AND CAUSE OF DEATH

In South Africa, during the past generation there has been a major migration into the towns of rural population —Bantu, Indian, Cape Coloured, and Afrikaans-speaking whites. In urban areas, where white and nonwhite populations are concentrated in closest proximity, problems of environmental sanitation, communicable disease control, and housing in relation to health assume major importance.

Some twenty years ago it was recognized that government subsidy was necessary to meet the housing needs of large segments of the population. Since then various subsidized housing projects have been developed. The effect of subsidized housing on health is still a matter for investigation, although it is known that under certain circumstances the provision of such housing is not necessarily correlated with improved health. For example, M'Gonigle and Kirby showed conclusively that the ability to purchase adequate nutrition was the basic determinant of health.

It is to this general problem that F. M. L. Stoker addresses himself.[1] He undertook to determine as accurately as possible the effect of subsidized housing on a given colored population,[2] and decided to approach the problem by analyzing the mortality data of the group. As a result of this inquiry it was found that pulmonary tuberculosis was a proportionately more frequent cause of death in the housing project and under favorable environmental conditions than in the general colored group. There is also some evidence to show that nutrition is more important for health than housing. The author points out that the results warrant further study in this field.

## DISEASE INCIDENCE IN SOUTH AFRICAN WHITES AND NEGROES

For clinical purposes, the incidence of most disease processes in South African whites is sufficiently well established. Experience has shown, however, that these values are not applicable to the Bantu population of South Africa. Charlewood and Frylinck studied these differences in the patient population of the three main teaching hospitals in Johannesburg.[3] They found that the average age of the Negro population was lower than that of the white. Abortions,

ectopic pregnancy, salpingitis, and fibromyomata were commoner in the Bantu than in the white group. The following were all commoner among the whites: appendicitis, peptic ulcer, functional uterine bleeding, genital prolapse, endometriosis, as well as benign conditions of the thyroid, breast neoplasms, ovarian tumors, and malignancies of the lip, stomach, bladder, prostate, rectum and colon. No significant difference in incidence was found for laryngeal growths, dermoid tumors of the ovary, carcinomata of the tongue and thyroid.

Several of these findings are the consequence of existing social conditions. Most malignant conditions occurred more commonly in the white population, probably because more whites survive into the older age groups. Similarly, the prevalence of salpingitis is indicative of the wide prevalence of venereal disease in the Negro group. Ill health of this kind, as well as the tuberculosis mentioned above, has its roots in poverty, ignorance or both. Overcrowding, which is a feature of all nonwhite housing, is an important contributory cause in the spread of diseases such as tuberculosis. This factor is also involved in the spread of venereal disease. More fundamental in the causal sequence, however, is the destruction of normal family life and the disorganization of the older tribal structure produced by the system of migrant labor.

### POLIOMYELITIS IN SOUTH AFRICA

During recent outbreaks of poliomyelitis in South Africa, it has been noted that relatively more paralytic infections occurred in whites than in Bantus. To explain this observation it was suggested that the relatively low incidence of paralytic poliomyelitis in the Bantus, and then mainly in the age group 0–5, is in part at least due to an immunity of the older age groups acquired as a result of previous infection. This hypothesis is supported by serological surveys which show that in all age groups a greater proportion of Bantu than Europeans have neutralizing antibodies against the Lansing strain of poliomyelitis virus.

In order to determine whether this serological immunity is developed in response to infection, a group of Bantu infants born and living in a native settlement were examined for poliomyelitis virus at regular monthly intervals.[4] The first examination was made within two weeks of birth. Of the 29 infants chosen, 16 remained under observation for the first full year of this study. During this period, four of the 16 proved to be infected with poliomyelitis virus. Three of these developed Lansing antibodies following their infection. None of the four infants who were proved to be infected had signs or symptoms suggestive of poliomyelitis at the time of their infection. From this evidence, it is presumed that the Lansing antibodies demonstrable in the sera of most older Bantu children develop as a result of a previous, usually silent infection with this type of virus.

### AN INFLUENZA EPIDEMIC IN CAPE TOWN

During the latter half of 1950 there was an epidemic of mild influenza in South Africa.[5] This epidemic offered the first opportunity for a systematic study of influenza in Cape Town. The virus strains that were isolated proved to be similar to some of those isolated elsewhere in South Africa during the epidemic and to strains previously isolated in the United States and Europe. The disease was mild and not associated with serious pulmonary complications. It is reported that the type of virus responsible for the epidemic in Cape Town was A prime. Judging by the absence of significant neutralizing antibodies in acute phase sera, and the high incidence of the infection, this type of virus has not been previously encountered in Cape Town, at least by the present generation.

### A WHOOPING COUGH EPIDEMIC IN AN URBAN NATIVE LOCATION

During the autumn and winter months of 1949 there occurred an epidemic of whooping cough which affected the infant and child population of Lamontville, a subsidized housing project in Durban. Phillips gives an account of this epidemic and the activities undertaken by the Lamontville Health Center in order to deal with it.[6] This account deals with cases which occurred during the first seven months of 1949. There were 103 cases in Lamontville, all in children born in 1940 or later. The total child population in this age group was 1,117. Although there were occasional cases in the first three months of 1949, the disease became epidemic in April, with a peak in May, and a sharp decline in the number of cases in June. During this epidemic, only two out of 95 inoculated children developed the disease, as compared with 101 of the remaining 1,022. The incidence of whooping cough during the epidemic was thus significantly lower in the inoculated children. Ninety-two children, aged between two and six years, attend a nursery school in the project. On the whole, it appears that the nursery school facilitated the spread of the epidemic among its children and among the children living in the same homes as the nursery school children. Inoculation of the children at the nursery school against whooping cough appeared to be effective and desirable in view of the ease of spread of the disease. In general, it is felt that the results of the inoculation of children in Lamontville provided more conclusive evidence of the effectiveness of the vaccine produced by the South African Institute for Medical Research. There is a problem, however, of getting the vaccine to the patient. This is basically a problem of health education. The author discusses the attitude of the people to whooping cough and what can be done about it.

### HUMAN CASES OF RIFT VALLEY FEVER IN JOHANNESBURG

Rift Valley fever, or enzoötic hepatitis, is an acute disease of sheep and cattle, caused by a virus presumably transmitted by mosquitoes. The disease was first described in 1931 in Kenya. As far as is known the infection does not occur under natural conditions outside Africa, although several infections have occurred among laboratory personnel in England and the United States. Mundel and Gear report the occurrence of human cases of Rift Valley fever at a farm 10 miles south of the center of Johannesburg.[7] The source of infection was traced to a bull which died of an acute illness and on post-mortem examination showed necrosis of the liver. From the liver a virus was isolated which proved to be that of Rift Valley fever. Three veterinary officers and two farm hands who participated in the post-mortem examination contracted the infection. At first it was thought the infection had been introduced by air as the farm is near an airport which receives traffic daily from Central Africa, including Kenya, where Rift Valley fever was discovered. It was found, however, that a widespread epidemic of the disease in the Orange Free State and the Western Transvaal had preceded the Johannesburg outbreak.

### BILHARZIASIS IN THE TRANSVAAL

Bilharziasis has been described in the Northern and Eastern Transvaal since this area was first settled by Europeans in the latter part of the 19th century. This fertile region was long laid waste and rendered unsuitable for agricultural development by the ravages of malaria which overshadowed bilharziasis. More recently as a result of research and control programs, malaria has ceased to be of economic importance in this region. Attention has now been turned to bilharziasis.

Wezel discusses the incidence of

*Bilharzia haematobium* infection based on the single urine examination of approximately 15,000 unselected white and Negro children and adults.[8] The bulk of the examinations were performed on children. The proved incidence ranged from 0 per cent in one district to 47 per cent in another. The probable incidence ranged from 0 per cent to 56 per cent. Wezel is of the opinion that the probable incidence represents more accurately the true incidence.

Annecke and Peacock [9] likewise discuss the problem of bilharziasis in the Transvaal. It is their belief that molluscicidal work is the only possible practical method by which the disease can be controlled in this area. Treatment alone as a method of bilharzia control is of very little value. Furthermore, these authors feel that education alone will not solve the problem; but that as supplementary measures both treatment and education can be of great value. As a primary step, therefore, in the campaign against the disease it was essential to study the habits and incidence of the various snail hosts of *B. haematobium* and *B. mansoni*. This work was begun in 1948–1949. The distribution of the more important fresh-water snails is given for different parts of the Transvaal; and the distribution in various habitats of the known vectors *Physopsis africana* and *Planorbis pfeifferi* is given. Various molluscicides are discussed and the opinion is expressed that copper sulfate is at present the molluscicide of choice. Success of any control program must largely depend on the coöperation of the farming community. It will be necessary to convince the farmer that copper sulfate will have no deleterious effects on cattle or crops. Urine examinations performed during 1937–1938 and 1948–1950 give percentage incidences of bilharziasis among Negro school children ranging from 4 per cent to 88 per cent. Corresponding figures for white school children vary from 3 per cent to 17 per cent. As yet the Department of Health has undertaken no systematic campaign to control bilharziasis, for which the work reported in this paper is a necessary preliminary.

### ENDEMIC SYPHILIS IN AFRICA

Forms of extra-venereal syphilis are found among primitive peoples all over the world. While performing a venereal disease survey in Southern Rhodesia, Willcox discovered another local variety of extra-venereal syphilis masquerading under the name njovera.[10] The infection is transmitted by close contact, sleeping huddled together in crowded huts and rondavels, by the common drinking bowl, and possibly also by flies. *Njovera* and *bejel* are believed to be identical. According to Willcox, the occurrence of chancres on the nipples of mothers feeding their children, with well marked secondary lesions, is suggestive evidence of extra-venereal infection. The disease appears to be on the decline, owing to the policy of treating for syphilis all patients and their relatives who come to clinics. The author reports that cases of this disease react extremely well to single injections of 1.2—2.4 mega units of procaine penicillin G with 2 per cent aluminum monostearate. Not only does this offer a reasonable hope of cure to the individual early case, but it is also a powerful public health measure which, if widely used, may rid an area of its infectious cases and thus bring about a marked fall in incidence. This method was used in Southern Rhodesia.

### MALARIA CONTROL IN SOUTHERN RHODESIA

For many years, malaria has been the most serious health problem of Southern Rhodesia.[11] In 1946, experimental control of malaria by residual insecticides was initiated. The success of these initial efforts led to the organization of a larger program. With the aid of funds

provided by the Southern Rhodesia State Lottery Trustees, £50,000 were set aside for a two year program of malaria and bilharziasis control. In malaria control only residual insecticide spraying was employed. No organized prophylactic campaign was undertaken nor were antilarval measures used. An educational campaign was not carried on. The area chosen for the initiation of the program was the Upper Mazoe River catchment, an area of 1,900 square miles in extent, and including a good cross-section of Southern Rhodesia activity, native reserves, farms, small mines, and small urban settlements. The results were striking and changed what was rather cool interest in the project into enthusiastic coöperation by whites and Negroes alike. In the light of the experience already gained it has been decided to investigate two lines of attack for the future. Steps are now being taken to encourage all Town and Village Management Boards and the larger industrial, mining, and agricultural groups to undertake a residual spraying campaign to protect their communities. The second line of attack now under investigation is to inaugurate a ten year plan to apply residual insecticide to all habitations in the native reserves of Southern Rhodesia. It was expected that this work would start in September, 1951, with five teams to cover 14 native reserves in Northern Mashonaland with an area of 3,600 square miles and a population of 174,000. It is expected that campaigns of this kind will open up large areas of land at lower altitudes to agricultural development.

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NOTE: This is the first of two columns devoted to African health problems. The second will appear shortly.

# ASSOCIATION NEWS

AUGUSTA JAY, EDITORIAL ASSOCIATE

Mrs. Augusta Jay, Editorial Associate of the *Journal* for more than 30 years, died on January 2 after a six months' illness. Mrs. Jay occupied a pivotal place in *Journal* affairs ever since the Association moved its offices to New York in 1921. Her outstandingly faithful service and patient dealing with the multiple problems of *Journal* production won the respect and affection of countless contributors. Her monument is 30 volumes of the *American Journal of Public Health*, the mechanical details of which were executed or supervised by her.

NEWS OF A.P.H.A. AFFILIATED SOCIETIES AND BRANCHES

The following new officers were elected at recent meetings of several Affiliated Societies and the Western Branch of the American Public Health Association:

*Florida Public Health Association*—23rd Annual Meeting, October 4–6, 1951, Miami Beach

*President*—May S. Pynchon, Executive Secretary, Florida Tuberculosis and Health Association
*1st Vice-President*—Dr. W. L. Wright, Sarasota
*2nd Vice-President*—R. E. Henshaw, Miami
*Secretary*—Fred B. Ragland, Director of Finance, State Board of Health
*Treasurer*—Elsie B. Hyatt, Administrative Assistant, Bureau of Vital Statistics, State Board of Health
*Representative to Governing Council of A.P.H.A.*—Wilson T. Sowder, M.D., State Health Officer
*Delegate to Governing Council of Southern Branch, A.P.H.A.*—Frank M. Hall, M.D., Director, State Board of Health Training Center

*Minnesota Public Health Conference*—5th Annual Meeting, September 28–29, 1951, Minneapolis

*President*—Charles G. Sheppard, M.D., Health Officer of Hutchinson
*1st Vice-President*—C. V. E. Cassel, D.D.S., Secretary, Minnesota State Dental Association
*2nd Vice-President*—W. O. B. Nelson, M.D., Health Officer of Fergus Falls
*Treasurer*—Allan Stone, Executive Secretary, Minnesota Division, American Cancer Society
*Executive Secretary*—Dean S. Fleming, M.D., Director, Division of Preventable Diseases, State Department of Health

*Oklahoma Public Health Association*—9th Annual Meeting, November 15–17, 1951, Stillwater

*President*—Loyd F. Pummill, Assistant Engineer, Field Technical Unit, State Department of Health
*Vice-President*—Charles D. Cluen
*Secretary-Treasurer* — Marjorie Butler, Records Consultant, State Department of Health

*Pennsylvania Public Health Association*—1952 Annual Meeting, September 21, Pittsburgh

*President*—I. Hope Alexander, M.D., Director, Pittsburgh Department of Health
*President-Elect*—William G. Mather, Ph.D., Professor of Rural Sociology, Pennsylvania State College
*Vice-President*—George S. Klump, M.D., Private Practice, Williamsport
*Secretary-Treasurer* — Mary Arnold, Chief, Office of Health Education, Pittsburgh Department of Health

*South Carolina Public Health Association*—28th Annual Meeting, November 16, 1951, Columbia

*President*—George A. Bunch, D.D.S., Director Division of Dental Health, State Board of Health
*President-Elect*—Mary B. MacFarlane

*Vice-President*—J. H. Stephens, Chief Sanitary Engineer, State Board of Health
*Treasurer*—J. C. Harrison
*Secretary*—Carrie B. DuPriest, State Board of Health

*Washington State Public Health Association*—16th Annual Meeting, September 17–18, Bellingham

*President*—Sam I. Reed, Chief, Division of Sanitation, Bremerton-Kitsap County Health Department
*President-Elect*—W. R. Giedt, M.D., Head, Section of Epidemiology, State Department of Health
*Vice-President*—C. E. Morris, Field Representative, Washington Tuberculosis Association
*Secretary*—Elizabeth D. Massier, Secretary, Tacoma-Pierce County Health Department
*Treasurer*—Geraldine Fletcher, Staff Public Health Nurse, Seattle-King County Health Department

*Western Branch, American Public Health Association*—18th Annual Meeting, October 29, 1951, San Francisco

*President*—L. J. Peterson, Administrative Director, State Department of Public Health, Boise, Ida.
*President-Elect*—L. H. Howard, M.D., Director, Pima County Health Department, Tucson, Ariz.
*Vice-Presidents*—Edward L. Van Aelstyn, M.D., District Health Officer, Cowlitz-Wahkiakum County Health District, Kelso, Wash.; Roy J. Cleere, M.D., Executive Director, State Department of Public Health, Denver, Colo.; D. D. Carr, M.D., County Health Officer, Clark County Health Department, Las Vegas, Nev.
*Secretary-Treasurer* — Harold F. Gray, Lecturer in Public Health, School of Public Health, University of California, Berkeley, Calif.

The Western Branch will hold its 19th Annual Meeting in Denver, Colo., June 3–6, 1952. The headquarters hotel will be the Shirley-Savoy. James P. Dixon, M.D., is Chairman of the Annual Meeting Committee, Graydon Dorsch is Chairman of the Local Arrangements Committee, and the program is being developed under the Chairmanship of Lloyd Florio, M.D. Owen B. Stubben is Chairman of the Denver Regional Finance Committee.

## APPLICANTS FOR MEMBERSHIP

***The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.***

*Health Officers Section*

James E. Galbraith, M.D., M.P.H., 406 L. Street, Hoquiam, Wash., Health Officer, Grays Harbor County Dept. of Health

Jose R. Garcia, M.D., Betances, Maricao, Puerto Rico, Director, Public Health Unit, Puerto Rico Dept. of Health

Otto Hoke, M.D., P. O. Box 1729, Durham, N. C., Medical Officer, Venereal Disease Division, Public Health Service

P. T. Howell, M.D., D.Rad., Scott County Health Dept., Forest, Miss., Director

Armando Lara-Munoz, M.D., Raymondi 88, Iquitos, Peru, S. A., Jefe del Centro de Medicina Preventiva, Servicio Cooperativo Interamericano

David G. McCurdy, M.D., C.M., C.P.H., 103 Charlotte St., Sydney, N. S., Canada, Divisional Medical Health Officer

Calvin S. McLaughlin, Jr., M.D., Box K, Crow Agency, Mont., Senior Medical Officer, Bureau of Indian Affairs

Allen F. Murphy, M.D., West Liberty, Ky., Health Officer, Wolfe County and Morgan County Health Depts.

*Laboratory Section*

Harry H. Borowsky, 190 Warren St., Jersey City, N. J., Chemist and Bacteriologist, Onyx Oil & Chemical Co.

Herman M. Kanner, Blossom Dairy Co., 114 Virginia St., Charleston, W. Va., Dairy Technician

Toshiko Katsumoto, 419½ Eighth St., Marysville, Calif., Public Health Bacteriologist, Sutter-Yuba Health Dept.

John A. Lagomarsino, 2131 Wantagh Ave., Wantagh, N. Y., Director, Professional Diag-

nostic Laboratory and Laboratory of Clinical Analysis

Manuel Rodriguez-Leiva, M.D., Institute of Microbiology, University of Chile, Santiago, Chile, S. A., Student, School of Public Health, University of California

Sidney A. Schwartz, Box 394, East Moriches, N. Y., Bacteriologist-in-charge, Suffolk County Dept. of Health Laboratory

Leck Tanasugarn, D.V.M., M.S., 201 Milford St., East Lansing, Mich., Student of Bacteriology, Michigan State College

*Statistics Section*

Cecilio J. Morales, Thames 2432, Buenos Aires, Argentina, S. A., National Director of Demological Investigations, Ministry of Public Health

Dewey Shurtleff, M.P.H., 2812 Que St., S.E., Washington 20, D. C., Analytical Statistician, National Office of Vital Statistics

*Engineering Section*

H. O. Bealmear, P. O. Box 846, Asheville, N. C., District Milk Sanitarian, State Board of Health

Blair I. Burnson, East Bay Municipal Utility District. 2127 Adeline St., Oakland 7, Calif., Supervising Sanitary Engineer

Paul De Falco, Jr., 95-05 57th Ave., Elmhurst 73, N. Y., Sanitary Chemist, Interstate Sanitation Commission

Wilbur P. Green, 906 Alandale St., Klamath Falls, Ore., Sanitarian, Klamath County-Klamath Falls Health Dept.

Marvin D. Strauss, 1426-21st St., N.W., Washington 6, D. C., Bacteriologist, U. S. Food and Drug Administration

Bernard E. Volkman, 8426 Tyrone Ave., Van Nuys, Calif., Sanitation Inspector, Los Angeles City Health Dept.

*Industrial Hygiene Section*

Lawrence F. Dieringer, 431 The Fenway, River Edge, N. J., Instructor of Industrial Hygiene, Dept. of Industrial Hygiene, New York University

John A. Holt, 13 Knight Ave., Easthampton, Mass., Sanitarian, Hartford (Conn.) Health Dept.

M. S. Schulzinger, M.D., M.A., 340 Reading Rd., Cincinnati 2, Ohio, Physician, Industrial Emergency Hospital

Robert P. Sim, M.D., 15 West 51 St., New York 19, N. Y., Senior Physician, Esso Standard Oil Co.

*Food and Nutrition Section*

George Q. Cannon, Dairymen's Assn., Ltd., P. O. Box 1880, Honolulu, T. H., Vice-President and Manager, Milk Division

A. G. Marcus, P. O. Box 1880, Dairymen's Assn., Ltd., Honolulu, T. H., President and General Manager

*Maternal and Child Health Section*

Conway S. Magee, M.D., Suite 20, Gordon Bldg., Lake Charles, La., Pediatrician

*Public Health Education Section*

Alfred D. Aki, 3730 Keanu St., Honolulu, T. H., Secretary and Department Manager, Service Cold Storage Co., Ltd., and Director, Oahu Health Council

Ethel H. Blair, R.N., Miners' Hospital, Crawford Ave., Spangler, Pa., Director of Nursing

John W. Collins, M.A., 107 First Ave., S.W., Ardmore, Okla., County Health Educator and Executive Secretary, Carter County Health Dept.

Alice O. Ford, D.H., 1443 Channing St., N.W., Washington 18, D. C., Instructor in Dental Hygiene, Howard University

Kathryn Gruby, 939 East 223 St., New York 66, N. Y., Health Educator, New York City Dept. of Health

Richard G. Hahn, M.D., M.P.H., 4 Warren Place, Montclair, N. J., Staff Member, Division of Medicine and Public Health, Rockefeller Foundation

Blanche B. Haley, R.N., M.P.H., 419 S. Edgeworth St., Greensboro, N. C., Field Secretary, North Carolina Congress of P.T.A.

Marvin M. Leeds, 912 Linden Blvd., Brooklyn 3, N. Y., Administrative Assistant, Brooklyn Tuberculosis and Health Assn.

Jose G. Olea, M.D., 2210 Bancroft Way, Berkeley 4, Calif., Student, School of Public Health, University of California

Luella J. Uhrhane, R.N., M.P.H., 6446 College Station, Durham, N. C., Asst. Professor of Health Education, Duke University

Bessie S. Ware, The Dairy Council, 310 Health Bldg., Durham, N. C., Director

Donald D. Waterstreet, M.S., 621 Furnald Hall, Columbia University, New York 27, N. Y., Student

Mary E. Young, M.P.H., 409 Woodlane, Apt. 12, Little Rock, Ark., Supervisor, Tuberculosis Case Register, State Health Dept.

*Public Health Nursing Section*

Aileen B. Berthiaume, M.A., 756 Colorado Blvd., Denver 7, Colo., Asst. Professor and Coördinator of Public Health and Outpatient Nursing, University of Colorado School of Nursing

Angela Brandley, 2879 East 194 St., Bronx 61, N. Y., Field Supervising Public Health Nurse, New York City Dept. of Health

Mary E. Fitzpatrick, 3157 Peachtree St., N.E.,

Atlanta, Ga., Hospital Nurse Consultant, State Dept. of Health

Lucille F. Kolb, 1000 Esplanade, Redondo Beach, Calif., Supervising Public Health Nurse, Los Angeles County Health Dept.

*Epidemiology Section*

Bruce D. Storrs, M.D., C.M., 30 Payne Road, Newton Highlands 61, Mass., Student, Harvard School of Public Health

*School Health Section*

Maya S. Unna, M.D., Harvard School of Public Health, 55 Shattuck St., Boston, Mass., Private Pediatric Practice

*Medical Care Section*

Walter E. Bock, M.A., Health Information Foundation, 420 Lexington Ave., New York 17, N. Y., Director of Research

William H. Hermann, 2738 Yale Station, New Haven, Conn., Student, Dept. of Public Health, Yale University

Clifford S. Johnson, M.P.H., 2615 27th St., Lubbock, Tex., Asst. Administrator, Lubbock Memorial Hospital

Carl L. Mosher, R.N., Apt. 4F, 500 Linwood Drive, Fort Lee, N. J., Student of Hospital Administration, Columbia University

George G. Reader, M.D., 525 East 68th St., New York 21, N. Y., Acting Director, Comprehensive Care and Teaching Program, New York Hospital-Cornell Medical College

Lance S. Wright, M.D., Public Health Service Medical Center, Hot Springs, Ark., Senior Assistant Surgeon, Venereal Disease Division

*Unaffiliated*

Frederick J. Brady, M.D., 16 Woodhaven Blvd., Bethesda 14, Md., International Health Representative, Division of International Health, Public Health Service

Ronald L. Hectorne, D.V.M., M.P.H., R.F.D. No. 3, Bridgeton, N. J., Public Health Veterinarian, State Dept. of Health

E. J. MacNamara, State Department of Health, Harrisburg, Pa., Comptroller

William G. Mather, Ph.D., 234 E. Hamilton Ave., State College, Pa., Professor of Rural Sociology, Dept. of Agricultural Economics and Rural Sociology

Ralph T. Palmer, 336 Canner St., New Haven, Conn., Student, Yale University

*A.P.H.A. membership application blank on page XXIX*

# EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

## POSITIONS AVAILABLE

**Public Health Physician** as Medical Director of Bi-County Health Department in southwestern Illinois on Ohio and Mississippi Rivers. Important public health job to be done. Salary $7,000. Apply Guy Jones, Secretary, Alexander-Pulaski Bi-County Board of Health, 1009 Walnut Street, Cairo, Ill.

**Medical Health Officer** for Shelby-Effingham County Health Department; central Illinois location; good schools; excellent rural communities; salary range $6,900–$9,000; may start above minimum; must have capacity for good public relations. Write to Mr. J. H. Griffin, Teutopolis, Ill., or to Dr. O. G. Kauder, Findlay, Ill.

**Psychiatrist** to Chronic Disease Research Institute to assume responsibility for directing, organizing, and integrating therapy in Alcoholic Center. Appointment to faculty. Requirements: Diplomate in Psychiatry desirable, intensive training and experience in psychotherapy and interest in research. Salary $10,000–$12,000. Write: Office of the Dean, University of Buffalo School of Medicine, 24 High Street, Buffalo 3, N. Y.

**Associate Medical Director** of life insurance company. Previous experience preferable but not required. Starting salary $11,200 with insurance and retirement benefits. Write **Box Ph-27,** Employment Service, A.P.H.A.

**Public Health Dentist**—to administer and operate a public health dental program in a city-county health department serving a population of 126,000. The program includes dental health education, topical applications of sodium fluoride and corrective dentistry. Headquarters in a cultural and civic center for southwest Michigan. Excellent supporting health program. Beginning salary, $6,300, plus mileage. Write W. B. Prothro, M.D., Director, City-County Health Department, Kalamazoo, Mich.

**Vector Control Specialists:** Opportunities in California with State Department of Public Health. Several vacancies with salary ranging from $5,232 to $6,360. Qualifications are four years of full-time paid experience in sanitary or public health engineering or in entomology, including two years of experience in vector control. (One year of graduate work in sanitary or public health engineering, entomology, or parasitology may be substituted for one year of nonvector control experience.) Also required is education equivalent to graduation from college with specialization in engineering or the biological sciences. Employment is in Berkeley and travel may be required. Write for details and application to State Personnel Board, 1015 L Street, Sacramento, Calif.

**Medical Health Officer** for Lawrence-Wabash County Health Department. Salary range $7,200–$8,400; may start above minimum; must have capacity for good public relations. Write Roy R. Rucker, Secretary-Treasurer, Lawrence-Wabash Health Department, Lawrenceville, Ill.

**Tuberculosis Consultant.** Washington State Health Department. Salary range $8,124–$9,732 per year. Eligibility for licensure in Washington and one year of experience in a tuberculosis clinic, hospital, or related practice required. Write Dr. J. A. Kahl, State Director of Health, 1412 Smith Tower, Seattle 4, Wash.

**Assistant Health Officer** for venereal disease and other communicable disease control. Salary range $593–$733 per month.

**Public Health Nurse**—five positions open. Generalized program. Salary range: $288–$352 per month.

**Public Health Engineer** to serve as Director of Environmental Sanitation. Salary range: $390–$480 per month.

**Junior Public Health Nurse.** Generalized program. Salary range: $261–$318 per month. Write: Department of Public Health, 2655 Pine Avenue, Long Beach 6, Calif., stating educational and professional qualifications.

**Crippled Children's Physician** for state health department program for crippled children. Minimum requirements master's degree in public health and two years experience or training in pediatrics. Must be United States citizen and eligible for

Connecticut license. Salary $7,020–$8,460.

**Medical Social Worker** in the Bureau of Maternal and Child Hygiene, Division of Crippled Children, State of Connecticut Department of Health. Salary $3,300–$4,020 with annual increments of $180 up to maximum of the bracket. Is part of professional team serving clinics in various communities throughout the state. Write: William T. Youngberg, Supervisor of Personnel, State of Connecticut Department of Health, Hartford, Conn.

**Nurse Educational Director. Also Supervisor.** Combination agency, generalized program, including bedside care. Forty hour week, cumulative vacation and sick leave, retirement. Good salary. Write: Executive Director, The Visiting Nurse Association, 401 Municipal Bldg., Dayton 2, Ohio.

Several qualified **Public Health Officers** are needed in Texas. Salary $7,200 per year plus a necessary travel allowance. Write George W. Cox, M.D., State Health Officer, Austin, Tex.

**Staff School Nurse** for small, well organized school health department; loveliest spot Pacific Coast. Beginning salary $3,350–$3,600 depending on training; 35 hour week; work nine calendar months, two weeks vacation Christmas, one week Easter. Annual increment for 10 years up to $5,500; tenure after three years. B.A. and P.H.N. degrees, own car. Send photograph, age, degrees, training, and experience, marital status, number of children. Write **Box Mi-5**, Employment Service, A.P.H.A.

**Supervisor of Nurses:** salary range $4,200–$4,500 depending on qualifications and experience; car furnished or liberal allowance granted if driving personal car; pension system, vacation and sick leave granted.

**Staff Nurse;** starting salary $3,340. Car furnished or liberal allowance granted if driving personal car; pension system, vacation and sick leave granted. Contact Mr. Edward Peters, Acting Health Officer, City Hall, La Crosse, Wis.

**Public Health Nurses** needed for generalized service in local health departments in Georgia. Entrance salary $2,760 with advancements to $3,480. Travel allowance for use of personal car. Liberal retirement benefits. Opportunities for further training. Write Personnel Administrator, State Health Department, State Office Building, Atlanta, Ga.

**Public Health Nurses** for staff positions in general public health program in enlarging health department in interesting county in southeastern Michigan. Close to two large university teaching centers in Public Health Nursing. Salary based on public health experience and training. County Pension Plan, vacation, and generous sick leave policy. Must have automobile, mileage is furnished. Apply: Director, Macomb County Health Department, County Building, Mt. Clemens, Mich.

**Public Health Nurse** with public health training. Salary based on experience. Excellent personnel policies. Generalized public health program. Apply: Civil Service Department, City Hall, Room 412, Dallas, Tex.

**Public Health Nurse** with certificate, for a generalized program in both urban and rural communities of the San Francisco Bay area. Salary $291 per month to a maximum of $356 in five years. Forty hour, five day week, retirement plan, sick leave. Apply: Director of Public Health Nursing, Alameda County Health Department, 576 Callan Avenue, San Leandro, Calif.

**Medical Director** at Tuberculosis Hospital; $4,820 per year plus full maintenance.

**Laboratory Technician** at $2,000 per year plus full maintenance.

**X-ray Technician** at $1,900 per year plus maintenance. Write Dr. Arthur J. Ledoux, Health Commissioner, Fall River, Mass.

**Health Officer,** City-County Health Unit. Population 90,000. Salary $11,000. Write: Mr. John Hall, City Manager, Pueblo, Colo.

**Director of Water and Sewage Section**—To direct on national level activities of this Section, supervision activities, approval of water and sewage treatment plans, establishment of standards and training of local sanitary engineers. Requirements: B.Sc. and preferably M.Sc. as Sanitary Engineer. Five years of experience in this field. Write: Miss Beatrice F. Altshuler, Secretary, Government of Israel, 11 East 70th Street, New York 21, N. Y.

**Extension Sociologist in Rural Health**—To work in rural health organization and public health education. Must have Master's degree in sociology (preferably rural). Minimum salary $4,000. May start above minimum depending on experience and training. Excellent opportunity in developing program. Write: Robert L. McNamara, Professor of Rural Sociology, University of Missouri, Columbia, Mo.

## POSITIONS WANTED

**Public Health Administrator**—Health Educator. M.Sc.Hyg. in health education from eastern university. Woman. Expert community organization, state, area, and city basis. Would prefer opening with university affiliation, east or west. Write: **Box HE-41** Employment Service, A.P.H.A.

**Medical Microbiologist.** Desires teaching, research, or departmental responsibility in public health school, city, or state public health laboratories; 16 years teaching experience in bacteriology, parasitology, medical mycology, and immunology. Honor and professional societies; numerous publications. Excellent references. Available June or September, 1952. Write: **Box LD-15**, Employment Service, A.P.H.A.

**Medical Student** with M.S.P.H. in sanitary science seeks summer employment. Navy Hospital Corps, teaching, camping experience. Unusual qualifications for several fields of public health and sanitation, industrial hygiene, camp intern. Age 28, married. Resumé sent on request. Write: **Box S-11**, Employment Service, A.P.H.A.

**Public Health Educator.** B.S., M.S., and Ed.D. (qualified). Eight years public health education experience, official health agencies, including teaching and writing. Write: **Box HE-42**, Employment Service, A.P.H.A.

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**All communications should be sent to Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.**

OPPORTUNITIES AVAILABLE FOR THE FOLLOWING: (a) COMMISSIONER OF HEALTH; university town; 70,000; Midwest. (b) PUBLIC HEALTH PHYSICIAN to direct school health program; school enrollment, 97,000; university city, 700,000; opportunity medical school appointment; West. (c) PUBLIC HEALTH PHYSICIAN to serve as medical consultant; major philanthropic organization; duties involve some travel; $12,000–$15,000. (d) DIRECTOR, student health department; outstanding administrator required; large university. (e) HEALTH COMMISSIONER; town of 50,000; staff of 25; South. (f) STUDENT HEALTH PHYSICIAN; duties include some teaching; California. (g) COUNTY HEALTH PHYSICIANS: salaries dependent on qualifications, up to $10,000. (h) ASSISTANT HEALTH OFFICER; California. (i) PUBLIC HEALTH NURSES; generalized field nursing service consultant and, also, consultant in visiting and industrial nursing; state health department, university town, Midwest. (j) CONSULTANT; several years' experience in public health nursing; administrator required; foreign appointment. (k) SUPERVISING AND STAFF NURSES; duties include school nursing; cars available; near San Francisco. (l) DIRECTOR, visiting nurse association; university town, Widwest. (m) DIRECTOR, rehabilitation program; large insurance company; New York, South, Southwest. (n) ASSOCIATE PROFESSOR OF HEALTH EDUCATION; preferably woman with doctorate; graduate and undergraduate students; state university; around $6,000 for school year. (o) HEALTH EDUCATOR; county health department; California. (p) HEALTH EDUCATOR; urban and rural area; New England. (q) SANITARY ENGINEER with practical experience in tropics, knowledge of Spanish; should be familiar with various tropical diseases; duties: charge of sanitation, construction project; South America. (r) SANITARIANS; Asia; $7,000. (s) SANITARY ENGINEER, state health department; headquarters, university town; Midwest. (t) SOCIOLOGIST; rural health program, Midsouth; Master's degree required. If you will write for our ANALYSIS FORM, we shall prepare an individual survey of opportunities which meet your requirements. BURNEICE LARSON, MEDICAL BUREAU, PALMOLIVE BUILDING, CHICAGO.

WANTED — OPPORTUNITIES FOR THE FOLLOWING—(a) PUBLIC HEALTH PHYSICIAN; M.P.H.; Diplomate, American Board of Preventive Medicine and Public Health; 4 years, director, university service; 7 years, director, city-county health department. (b) PUBLIC HEALTH DENTIST; M.P.H.; past several years, state health department of dentistry. (c) PUBLIC HEALTH NURSING ADMINISTRATOR; B. S. (Public Health Nursing); M. S. (Health Education); 3 years, instructor hygiene and college nurse, woman's college; 6 years, supervisor, health education, metropolitan department of health. (d) HEALTH EDUCATOR; B. S. (Physical Education and Health), M. S. (Health Education), Columbia University; considerable work toward Ph.D.; 6 years' teaching experience; professional rank, assistant professor, Health Education. (e) PUBLIC HEALTH ENGINEER; B. S. Chemical Engineering, M. S. Sanitary Engineering; 12 years' interesting experience including 4 years in South America. (f) STATISTICIAN; M. S., Ph.D. degree; 5 years' teaching experience; past several years, director vital statistics, division city health department. Please direct all inquiries to BURNEICE LARSON, MEDICAL BUREAU, PALMOLIVE BUILDING, CHICAGO.

# NEWS FROM THE FIELD

## WHO NEWS

### *Venereal Disease Control Center*

The first international model center for venereal disease control among seamen was opened in Rotterdam in December, 1951. The new Center, located in the Rotterdam Maritime Health Center, under the direction of Dr. E. H. Hermans, has the latest facilities for study and demonstration of recently developed techniques of venereal disease control. It is setting up short training courses for medical officers, nurses, laboratory technicians, and medical social workers from many countries. WHO has recruited international technical personnel and is providing fellowships and some materials. The Netherlands Government is making facilities of a special polyclinic available.

Rotterdam was chosen as the site because it is the largest European port of reception for overseas shipping, as well as the terminus for most shipping coming up the Rhine River from as far away as Basel. The recently organized Rhine River Anti-Venereal Disease Commission will also be located in the Center.

It is reported that port cities have not had the decline in venereal disease that has been evident in many inland areas. Norway, for example, reports that 44 per cent of new syphilis cases in 1946 were brought into ports by merchant seamen.

### *Public Health Administration*

The first meeting of the Expert Committee on Public Health Administration was held in Geneva for five days in December, with Ira V. Hiscock, Sc.D., chairman of Yale's Department of Public Health, serving as rapporteur. Dr. Karl Evang, Norway's director general of public health, was chairman. Other representatives were from Brazil, Canada, India, Pakistan, the United Kingdom, and Yugoslavia.

Reports so far available indicate that "the Committee considered and reported on the basic principles and practices of public health administration in relation to planning, organization and assessment of health services, the need for professional and technical staff and the financing of the services, including those for medical care."

### *Sanitation Measures for Cholera*

In November, WHO's Expert Committee on Cholera held its first meeting, a two-day session in Delhi. This Expert Committee has taken over the work in international control begun by the International d'Hygiene Publique, recently dissolved.

The Expert Committee urgently asked authorities of cholera endemic areas to concentrate on environmental sanitation programs, including pure water and waste disposal.

Dr. R. Pollitzer, secretary of the Committee, reported that in India alone cholera had killed nearly half a million persons in 1943. It was announced at the meeting that WHO will coöperate with the Pakistan Government in a pilot cholera control project in East Bengal. A sanitary engineer from the Eastern Mediterranean Regional Office was already in Pakistan making a preliminary study.

The Committee also recommended active research on improved methods of laboratory diagnosis and a permanent research center for intensive study of cholera problems.

C. G. Pandit, secretary of the Indian Council for Medical Research, was

chairman of the meeting. Dr. William Burrows, of the University of Chicago, represented the United States.

*New PASB Assistant Director*

M. G. Candau, M.D., M.P.H., Geneva, Switzerland, presently assistant director-general of WHO, resigned in December to become assistant director of the Pan American Sanitary Bureau, Washington, D. C., Regional Office of WHO, in March, 1952. He succeeds Paulo C. A. Antunes, M.D., M.P.H., who has resigned to become dean of the School of Hygiene and Public Health, University of Sao Paulo, Brazil. In the interim A. V. Sutter, M.D., of the WHO headquarters staff has been acting as assistant director of the Bureau.

Dr. Antunes has occupied important public health positions in the Brazilian Government, the Sao Paulo State Department of Public Health, and the Rockefeller Foundation. He joined the PASB in 1949. He has also been professor of rural health practice and parasitology at the School of Hygiene and Public Health in Sao Paulo where he is now becoming dean.

Dr. Candau has been at WHO headquarters for two years, first as director of the Division of Organization of Public Health Services. Earlier he was superintendent of Servico Especial de Saude Publica, a coöperative public health program of the Brazilian Government and the Institute of Inter-American Affairs.

PREVENTING CHILDHOOD ACCIDENTS

Called a fresh approach to the problem of childhood accidents, a year's pilot study is now under way at Babies Hospital of the Columbia-Presbyterian Medical Center in New York. The study is under the guidance of an advisory committee made up of representatives of education, psychiatry, epidemiology, pediatrics, accident prevention, and research methods, as well as of the Medical Center and of the Metropolitan Life Insurance Company. A grant from the latter is supporting the study.

Today accidents are the leading cause of death among children from 1 to 19 years of age. This study will attack the accident-prone problem among children. It is hoped to produce information that can be translated into practical guidance procedures in the home or routine instruction methods in the school.

The director of the study is William S. Langford, M.D., head of the Pediatric Psychiatric Clinic at Babies Hospital. Rustin McIntosh, M.D., director of Pediatric Service, Presbyterian Hospital, is chairman of the advisory committee.

RESEARCH BUILDING HONORS DR. SABIN

The University of Colorado School of Medicine in Denver dedicated on December 1 the Florence R. Sabin Building for Research in Cellular Biology. This building in honor of Dr. Sabin, a native of Colorado, former professor at Johns Hopkins University School of Medicine and former member of the Rockefeller Institute for Medical Research, New York, was made possible by a grant from the National Cancer Institute and by funds provided by citizens of the state to the University of Colorado. A brochure descriptive of the building was distributed to those in attendance, illustrating both the research and treatment facilities made possible by the building.

ALCOHOLISM INFORMATION CENTER

The Association for the Advancement of Instruction About Alcohol and Narcotics has been organized to aid American schools in developing techniques and materials for instruction about alcohol and narcotics. It has been launched by educators from 11 states, the District of Columbia, and Canada who attended the 1951 Summer School of Alcohol Studies at Yale University. The Association will serve as a clearing house for information and will stimulate members in develop-

ing new teaching techniques at different grade levels. It is expected that membership of the organization will be composed chiefly of individual public and private school teachers, supervisors and administrators, including health educators, school physicians, and school nurses, but will be open also to organizations and agencies concerned with the prevention and control of public health disorders.

Executive headquarters are at the Yale Laboratory of Applied Physiology, New Haven, Conn. In addition it is planned to maintain regional centers to serve the Western and Mountain States, the Middlewest, and the South.

### A NEW JOURNAL IN METABOLISM

*Metabolism: Clinical and Experimental* began bimonthly publication in January, 1952, to meet "the need for up-to-date, regular, correlative coverage of the important field" of metabolism and its direct relationship to every facet of medical science. Its editor is Samuel Soskin, director of the Medical Research Institute of Michael Reese Hospital in Chicago; associate editor, Fuller Albright, M.D., associate professor of medicine, Harvard Medical School. Among its 16 associate editors are 4 Fellows and 1 member of the American Public Health Association. Published by Grune & Stratton, 381 Fourth Ave., New York 16, $9 annually.

### ACCREDITATION OF SANITARY ENGINEERING CURRICULA

The 19th report, for 1951, of the *Engineers' Council for Professional Development* once again lists accredited undergraduate engineering curricula for the United States. Of those listed, 25 universities include a sanitary option and one a public health option under civil engineering, and 4 institutions offer a full curriculum in sanitary engineering. This represents an increase of 3 over the number of accredited civil engineering-sanitary options recognized in 1950. The report also discusses the accreditation of graduate engineering education, concluding that it should not be attempted at this time. The full report available from ECPD, 29 West 39th St., New York 18, 50¢.

### ENVIRONMENTAL RESEARCH LABORATORY

The American Society of Heating and Ventilating Engineers has opened a new Environment Laboratory in its Research Laboratory, 7218 Euclid Ave., Cleveland, Ohio. A study of human comfort in heated and cooled indoor places and the development of data for the design of heating and cooling systems are its chief purposes. Research work will also be carried on in the little explored field of odors. Construction of the laboratory is such that almost any type of room arrangement can be made and any type of climatic condition simulated. The facilities, available for the use of the 18 technical committees of ASHVE, are directed by Cyril Tasker, director of research. Opportunities of joint research with other organizations are welcome.

### SOCIOLOGIST IN PEDIATRICS

In the belief that the effect of the hospital environment on the sick child and his family needs reëvaluation, the Yale University School of Medicine has appointed a sociologist to the pediatrics department staff. The announced purpose is "to add to the effectiveness of medical care for children." The sociologist, with the rank of research assistant, holds a special sociology internship in pediatrics. The appointment, supported by the Russell Sage Foundation, is for one year but will be renewable if results are promising. Albert F. Wessen has been appointed the research assistant.

### HOSPITAL SICKNESS REPORTING SYSTEM

An 18 month experimental project to develop a method for continuous reporting of hospitalized diseases and injuries

has been undertaken jointly by the Russell Sage Foundation and the New York City Departments of Health and Hospitals. The reporting will be made over a six month period in municipal hospitals and a selected number of voluntary hospitals to yield a sample of approximately 160,000 discharge reports.

Co-directors of the study are Marta Fraenkel, M.D., director of the Medical Statistics and Records Service of the Hospital Department and co-author of the New York City hospital discharge study, and Carl L. Erhardt, director of the Health Department's Bureau of Records and Statistics.

### AIR RESCUE SERVICE AID TO YELLOW FEVER CAMPAIGN

The Air Rescue Service of the United States Air Force recently received public commendation from the Government of Costa Rica for aid in fighting a yellow fever epidemic which spread into Costa Rica from Panama in September, 1951. The Air Rescue Service, at the request of the Department of State, assigned a helicopter and six men in order to reach Costa Ricans in the difficult north central interior.

The Air Rescue Service group made 42 landings over an area covering more than 6,000 square miles during a period of 11 days. The helicopter transported Dr. Oscar Vargas, director of public health of Costa Rica, and Dr. Honorio Arias of the Ministry of Public Health, who were thus enabled to reach and to inoculate 1,000 Costa Ricans against yellow fever. The Air Rescue Service has 11 such rescue squadrons assigned to world-wide search and rescue duty under all conditions.

### SOCIETY OF PUBLIC HEALTH EDUCATORS

The Society of Public Health Educators was organized and held its first annual meeting in St. Louis in October, 1950. Its beginnings have been put on permanent record for present-day interest and for the future historian. A 30 page pamphlet tells the story of how a new profession came of age, gives Dr. Martha Eliot's address at the first annual dinner meeting, and includes the constitution and by-laws and a membership directory of its 59 members. Dr. Clair Turner, its first president, was succeeded by Dr. Mayhew Derryberry in November, 1951.

The pamphlet was published by the Health Publications Institute, from which it is available. 216 No. Dawson St., Raleigh, N. C. 50¢.

### NATIONAL SCIENCE FOUNDATION GRANTS

The National Science Foundation, which was established by Act of Congress in 1950, and which is authorized to support basic scientific research in the mathematical, physical, medical, biological, and engineering sciences by making grants for such research to educational, industrial, governmental or other institutions or individuals, has published a guide to assist those interested in applying for grants in research by the Foundation.

During the current fiscal year the Foundation has earmarked $1,500,000 for support of basic scientific research. The stated policy of the Foundation is to award grants to institutions for research conducted by specified individuals.

Persons interested in making application should communicate with the National Science Foundation, 2144 California Street, N.W., Washington 25, D. C.

### HOME CARE SERVICE PROGRAM THRIFTY

Three-quarters of a million dollars saved in nine months is reported in an analysis of the Home Care Service program in two New York municipal hospitals in which nurses of the health department supervise the nursing aspects of the program. As opposed to more than $800,000 that hospital care would

have cost in these two hospitals at $8.45 and $12.75 per diem, respectively, more than 11,000 home visits were made by nurses of the health department on a budget of less than $47,000. Nor was this the only saving reported. In addition, 220 hospital beds were freed for the care of the acutely ill.

But the report stresses the saving in human feelings. By and large to the patients, older persons suffering from heart diseases, cancer, and other long-time chronic illnesses, "hospitalization would mean unfamiliar food, separation from families, loneliness, and worry, which could aggravate and intensify their condition." The analysis includes a number of case histories to emphasize the human element.

The Home Care program was inaugurated by the health and hospital departments late in 1948 and is now in effect in 16 of the city's municipal hospitals. In 14 the nursing program is under the direction of voluntary visiting nurse services on a contract basis.

The analysis of the service in the two hospital programs with health department nursing supervision appeared in a news release of December 2, 1951. City of New York, Department of Health, 125 Worth St., New York 13.

### "ALERT AMERICA" FOR CIVIL DEFENSE

The Valley Forge Foundation, Inc., with offices in New York City, has undertaken an assignment in behalf of Civil Defense which is called the "Alert America" program, presented in coöperation with the Federal Civil Defense Administration. The "Alert America" Convoys will consist of three motorized units which will visit the major cities of the nation to dramatize Civil Defense. Each Convoy, during its stay, will participate in a local "Alert America" Week during which an intensive program of special events will emphasize Civil Defense.

The American Public Health Association is one of several national organizations coöperating in the "Alert America" exhibit. The purpose of the presentation is to drive home the reality and nature of the threat that faces the United States. It will also attempt to spell out specifically what the individual citizen can do to meet this threat, and how Civil Defense Services are organized at the state and local level to protect local communities.

The Convoys consist of three units of 32-foot trailers, each carrying the elements of a portable exhibit which, when assembled, will be 55 x 120 feet, somewhat larger than the average basketball court. These Convoys will visit principal urban areas and ultimately may cover all 48 states. More than 60 cities will be covered in the next six to nine months, according to the plan.

In each city the exhibit will be set up in an armory, an exhibit hall or gymnasium, remaining there from three to five days. Emphasis will be on what to do in the case of attack, Civil Defense recruiting, first aid training, blood donations, and other objectives. The formal opening was planned for January in Washington, after which one Convoy would start for the Middle West and the other through the South and up the Pacific Coast.

### STANFORD'S PEDIATRIC CONSULTANT

The Department of Pediatrics of Stanford University Medical School has been reorganized to strengthen its teaching program in the health supervision of the well child. Well child clinics will be used for teaching health supervision of infants, including premature infants; group work with mothers; the physician's role in fostering favorable emotional growth and development; and problems of school age and adolescent children. A pediatric consultant has been employed whose responsibilities include both teaching services and staff consultation on pediatric problems to

rural practising physicians, medical groups, hospital staffs, and health departments in the northern part of the state. The pediatric consultant participates in the training program for undergraduate, graduate, and postgraduate medical students in the principles of infant and well child care. The program has financial assistance from the California State Department of Health.

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## PERSONALS

WARREN D. ALDRIDGE, D.D.S., has recently been added to the staff of the Tulsa City-County Health Department, Okla.

ALBERT E. BAILEY, PH.D.,* has been appointed director of the newly organized Office of Statistics and Records of the Pennsylvania Department of Health, Harrisburg. Prior to joining the State Health Department, Dr. Bailey was associated with the National Office of Vital Statistics, U.S.P.H.S.

AMY A. BAIRD, PH.D., former director of handicapped children's programs in Missouri, has been appointed co-director of the Cerebral Palsy Center at Billings, sponsored by the State Board of Health, Eastern Montana College, and the Montana chapter, National Society for Crippled Children and Adults.

CHESTER I. BARNARD, soon to retire as president of the Rockefeller Foundation and General Education Board, has been elected chairman of the National Science Board of the National Science Foundation, Washington, D. C., to succeed JAMES B. CONANT, president of Harvard University, who was the first chairman of the Board.

COL. RUBY F. BRYANT has been sworn in as the ninth chief of the Army Nurse Corps, succeeding Col. MARY G. PHILLIPS, who retired recently after 22 years of service.

CURTIS F. CULP, M.D., who served in the Army Medical Corps from 1942 to 1949, during which time he was in charge of activating and deactivating numerous hospitals in North Africa, France, and Germany, has been appointed assistant director of medical services for the National Foundation for Infantile Paralysis.

GUSTAVE J. DAMMIN, M.D.,* professor of pathology and head of the Department of Pathology, School of Medicine, Washington University, St. Louis, Mo., and director of Central Laboratories, Barnes Hospital, was recently appointed consultant for laboratories services to the Health and Special Weapons Defense Division, Federal Civil Defense Administration, Washington, D. C.

BERNADINE DODRILL, former public health nurse Kanawha-Charleston (W. Va.) Health Department, is now in a similar position with the North Carolina Health Department.

WALTER DUNN,† on loan from the U. S. Public Health Service, is training specialist in the Field Training Center of the Oklahoma State Health Department, Norman.

JACK R. EWALT, M.D., dean of the Postgraduate School of Medicine, Houston, Tex., has resigned to become commissioner of mental health for Massachusetts.

ALICE B. FRAZER, during the past 2 years health educator, Colorado State Department of Public Health, has been appointed a trainee, New York State Committee on Tuberculosis and Public Health, New York City.

MELVIN GOODMAN, M.D., has been assigned by the Communicable Disease Center of the U. S. Public Health Service to work in the Bureau of Epidemiology and Communicable Disease Control, New York State Department of Health, during the current year.

NELL GUTHRIE† has been appointed public health educator, Tulsa City-County Health Department, Okla.

E. J. HERRINGER,* engineer with the U. S. Public Health Service, has been assigned as sanitary engineer director of the National Housing Board of the Government, Union of Burma, Rangoon, with a program including architectural hygiene, environmental sanitation, health education, and housing hygiene research.

DAVID M. HEYMAN,† New York City, has been appointed a member of the National Advisory Health Council to the National Institutes of Health, Bethesda, Md.

IRA V. HISCOCK, SC.D.,* Yale University, New Haven, Conn., has been elected to Associate Fellowship in the American Academy of Pediatrics in recognition of his contributions to pediatrics and child health.

EDWARD L. HOLMES,* formerly director, Department of Bakery Sanitation, American Institute of Baking, Chicago, Ill., has been appointed executive director, American Sanitation Institute, St. Louis, Mo.

STEWART S. HOWE has been appointed director of development and public relations, National Sanitation Foundation, Ann Arbor, Mich.

CATHERINE HYDE is back as executive secretary

* Fellow.
† Member.

of the Genesee County (N. Y.) Committee on Tuberculosis and Public Health after a year's leave of absence for advanced study.

KARL M. MASON * has been appointed director of the newly organized Office of Professional Training of the Pennsylvania Department of Health. Prior to his assignment Mr. Mason was director, Pittsburg Field Training Center, U.S.P.H.S.

CHERIE MCDOUGALL, recently assistant dean at Salem Academy, North Carolina, is now health educator, Cancer Control Section, Division of Preventive Medical Services, Kentucky State Department of Health.

SAM O. MCELDOWNEY, employed by Kentucky State's Division of Forestry, has been named sanitarian for the newly organized Lewis County (Ky.) Health Department.

CHARLES F. MCKHANN, M.D.,* consultant in pediatrics to the Surgeon General of the U. S. Army and president of the American Board of Pediatrics, has been appointed to the newly created position of acting medical director, United Cerebral Palsy Association.

JAMES H. MEANS, M.D.,† Cambridge, Mass., has been appointed a member of the National Advisory Health Council to the National Institutes of Health, Bethesda, Md.

FREDERICK D. MOTT, M.D., C.M.,* medical administrator of the Memorial Hospital Associations of Virginia, West Virginia, and Kentucky, and senior medical consultant to the United Mine Workers of America Welfare and Retirement Fund, was recently appointed a member of the WHO Expert Advisory Panel on Social and Occupational Health.

F. LLOYD MUSSELLS, M.D., has been granted a 2 year leave of absence as assistant director of Strong Memorial Hospital, Rochester, N. Y., to serve as deputy executive director, Committee on Medical Sciences, Research and Development Board, Department of Defense, Washington, D. C.

BASIL O'CONNOR,† president of the National Foundation for Infantile Paralysis, was given a dinner in honor of his 60th birthday and the anniversary of his 25 years in the fight against polio, January 7, at the Waldorf-Astoria in New York City.

GEORGE E. OSTERMANN, chief clerk since 1944, has been made deputy commissioner of health in charge of administrative services, New York City Department of Health, succeeding MATTHEW A. BYRNE, deceased.

MARGUERITE J. QUENEAU,* associate public health nutritionist in the New York State Health Department's Bureau of Nutrition, is on leave of absence to become student adviser in the Department of Maternal and Child Health, Harvard School of Public Health. ETHEL POTTEIGER SCHOONMAKER, senior public health nutritionist, succeeds Miss Queneau.

ANNETTE RIORDAN,† former executive director of the Ontario County (N. Y.) Tuberculosis and Health Association, is now personnel consultant in charge of recruitment for the National Tuberculosis Association Personnel Service in New York City.

CESAR RODRIQUEZ EXPOSITO has been appointed historian of public health in the Ministry of Health and Social Assistance, Republic of Cuba, Havana. Dr. Rodriquez Exposito welcomes interchange of historical information with persons in public health.

DAVID ROSS, M.D., formerly head of the Seton Institute of Baltimore, has been named medical director of the National Hospital for Speech Disorders in New York City, succeeding the late JAMES S. GREENE, M.D., who founded the hospital in 1916.

WILLIAM H. ROST,* director of the Bureau of Public Health Education, West Virginia State Department of Health, has resigned to join the field staff of the Institute of Inter-American Affairs. He will be a member of the field party stationed in Panama City and health education consultant to Panama's Ministry of Health, as part of the Point IV Program.

LORAINE SCHMIDT, M.D., formerly of the staff of the Muskogee County Health Department, is assistant health officer of Cleveland County, Oklahoma.

DALE SCHOLZ, M.D.,* former medical director of the Lawrence-Wabash County Health Department in Southern Illinois, is now regional medical director of the New York area of Armour Laboratories.

LEONARD M. SCHUMAN, M.D.,* deputy director of the Division of Preventive Medicine, Illinois Department of Public Health, on leave of absence, is on a medical mission to study injuries attributable to cold weather in the Korean battle area.

CHARLES E. SMITH, M.D.,* dean of the University of California School of Public Health, Berkeley, has been appointed a member of the National Advisory Health Council to the National Institutes of Health, Bethesda, Md.

W. STEINMAN, M.D., is on loan to the State of Oklahoma from the Public Health Service to serve as assistant health officer of Comanche County.

DOROTHY TAYLOR,† medical social consultant, Division of Maternal and Child Health,

* Fellow.
† Member.

West Virginia State Department of Health, has resigned to become medical social worker, Kanawha-Charleston Health Department.

R. A. VONDERLEHR, M.D.,* medical director in charge, Communicable Disease Center, Public Health Service, Atlanta, Ga., has transferred to the position of regional medical director of FSA Region 6, Atlanta.

MILDRED E. WHITE, D.H.,† formerly with the U. S. Public Health Service as director of the Louisiana Dental Demonstration Unit, has resigned to become instructor in dental hygiene and to help establish a school of dental hygiene at the University of Alabama, Birmingham.

GEORGE WILSON, assistant industrial hygienist, Bureau of Industrial Hygiene, West Virginia State Department of Health, has resigned to be in charge of sales for Chemical Formulators, Charleston.

MARION L. WOOD, who served an apprenticeship of 1 year in the Office of Public Health Education and in various county health departments in the state, has been appointed public health educator, Westchester County (N. Y.) Health Department.

The following nurses have been added to local health departments in Oklahoma: MARY P. BROOK, Choctaw County; ALGENE CALHOUN, Garvin County; LORENE CHANCEY, Pontotoc County; CLEO H. EALES, Tillman County; DAVINE EPHRAIM, Tulsa City-County Health Dept.; REGINA GROSZEK, Kiowa County; CELIA P. MIDDLETON, Ottawa County; PATRICIA OGLESBY, Payne County; EDITH C. RUST, Marshall County; ODESSA RAMSEY, Sequoyah County; ALICE TANAKA, Cleveland County; CHRISTINE TAYLOR, Comanche County; BETTY JO TARVER, Carter County; MILDRED THOMAS, Kay County; RENA WILLIAMS, Kay County. In addition, FLORINE ROGERS and MARTHA NIGHTINGALE, on educational leave, have returned to Latimer and Peabody Counties, respectively.

The following sanitarians have been added to local health departments in Oklahoma: BILLY HAMILTON, Muskogee County; JAMES R. MILNER, Creek County; J. W. STACEY, Hughes County; HAROLD L. SAVAGE, Kay County; DON A. STRONG, Comanche County.

## DEATHS

CHARLES C. P. ANNING, D.P.H.,* chief medical adviser, Department of Social Service, Transvaal Chamber of Mines, Johannesburg, South Africa, on October 12, 1951 (Unaffiliated).

WILLIAM LLOYD AYCOCK, M.D.,* associate professor of preventive medicine, Harvard University (Epidemiology Section).

E. H. BRAMHALL,* of Albany, Calif., suddenly, on November 30, 1951 (Laboratory Section).

R. DAVIS,† technician, Davis X-ray and Clinical Laboratories, Nevada, Mo. (Laboratory Section).

LOURDES B. GORDON, M.D.,† of Chicago, Ill., on October 17, 1951 (Health Officers Section).

JOHN S. HAYDOCK,† osteopathic physician and surgeon, Philadelphia, Pa., on August 31, 1951 (Engineering Section).

AUGUSTA JAY,† Editorial Associate of the *Journal* for more than 30 years, on January 2 after a six months' illness (Unaffiliated).

FRANCOIS F. ROUGON, M.D.,† of New Roads, La. (Health Officers Section).

CLARA E. RUMMENIE,† supervisor, Nursing Division, Quincy Health Department, Quincy, Ill., on November 11, 1951 (Public Health Nursing Section).

K. SUBRAHMANYAN, professor of sanitary engineering in Calcutta's All-India Institute of Hygiene and Public Health, in an airplane crash on October 20, 1951.

MAY UPTON, R.N., 62, who had been a public health nurse for 24 years, since 1930 as public health nurse in McCreary County (Ky.), in an accident November 2, 1951, as she drove her jeep through mountain roads to serve her people.

* Fellow.
† Member.

## CONFERENCES AND DATES

**American Public Health Association. Headquarters, Public Auditorium, Cleveland, Ohio. Oct. 20–24.**

*Coming in February, March, April, and May:*

Academy of Political Science. Hotel Astor, New York, N. Y. Apr. 24.

American Academy of General Practice. Atlantic City, N. J. Mar. 24–27.

American Academy of Political and Social Science. Benjamin Franklin Hotel, Philadelphia, Pa. Apr. 18–19.

American Association of Medical Social Workers. Annual Business Meeting. Chicago, Ill. May 27.

American Congress on Obstetrics and Gynecology. Netherland Plaza Hotel, Cincinnati, Ohio. Mar. 31–Apr. 4.

American Heart Association. Hotel Statler, Cleveland, Ohio. Apr. 17–20.

American Psychiatric Association. Convention Hall, Atlantic City, N. J. May 12–16.

American Social Hygiene Association. New York, N. Y. Feb. 6.

American Society for Public Administration.

Hotel Statler, Washington, D. C. Mar. 7–9.

American Water Works Association:
- Annual Conference. Kansas City, Mo. May 4–9.
- Arizona Section. Maricopa Inn, Phoenix. Apr. 3–5.
- Illinois Section. La Salle Hotel, Chicago. Mar. 26–28.
- Indiana Section. Lincoln Hotel, Indianapolis. Feb. 13–15.
- Montana Section. Northern Hotel, Billings. Apr. 11–12.
- New Jersey Section. Essex House, Newark. Feb. 13.
- Southeastern Section. Bon Air Hotel, Augusta, Ga. Mar. 24–26.

Annual Congress on Medical Education and Licensure, A.M.A. Chicago, Ill. Feb. 11–12.

Child Study Association of America. Hotel Statler, New York, N. Y. Mar. 3.

Georgia Public Health Association. Hotel DeSoto, Savannah. May 5–7.

Illinois Public Health Association. Leland Hotel, Springfield. Apr. 3–4.

Iowa Public Health Association. Fort Des Moines Hotel, Des Moines. Apr. 24–25.

Kansas Public Health Association. Town House, Kansas City. May 5–7.

Latin American Congress of Physical Medicine. Panama City, R. P. Feb. 24–29.

Michigan Public Health Association. Statler Hotel, Detroit. May 14–16.

Middle States Public Health Association with Wisconsin Public Health Association. Hotel Schroeder, Milwaukee, Wis. Apr. 7–9.

Missouri Public Health Association. Colonial Hotel, Springfield. May 1–3.

National Conference on Rural Health, A.M.A. (Seventh). Denver, Colo. Feb. 29–Mar. 1.

National Conference of Social Work. Chicago, Ill. May 25–30.

National Health Council. Roosevelt Hotel, New York, N. Y. Mar. 13–14.

National Society for the Prevention of Blindness. Hotel New Yorker, New York, N. Y. Mar. 28–30.

National Tuberculosis Association. Copley-Plaza Hotel, Boston, Mass. May 25–29.

Ohio Public Health Association. Deshler-Wallick Hotel, Columbus. May 26–28.

Planned Parenthood Federation of America. Hotel Roosevelt, New York, N. Y. May 2–4.

Purdue Industrial Waste Conference (Seventh). Purdue University, Lafayette, Ind. May 7–9.

State Charities Aid Association State Committee on Tuberculosis and Public Health. Hotel Statler, New York, N. Y. Apr. 21–23.

Southern Branch, A.P.H.A. Lord Baltimore Hotel, Baltimore, Md. Apr. 17–19.

Tennessee Public Health Association. Andrew Jackson Hotel, Nashville. Mar. 25–27.

Texas Public Health Association. Galveston. Feb. 17–20.

United States-Mexico Border Public Health Association. Monterrey, Nuevo Leon, Mexico. Mar. 17–20.

West Virginia Public Health Association. Daniel Boone Hotel, Charleston. May 8–10.

Wisconsin Public Health Association with Middle States Public Health Association. Hotel Schroeder, Milwaukee, Wis. Apr. 7–9.

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National Farmers Union, Denver, Colo.
New York Hotel Trades Council and Hotel Association Health Center, Inc., New York, N. Y.
Orkin Institute of Industrial Sanitation, Atlanta, Ga.
Oval Wood Dish Corp., Tupper Lake, N. Y.
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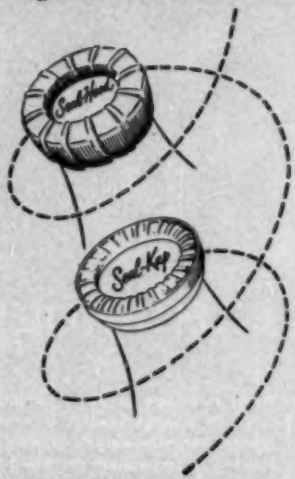


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